STRATEGIC SOCIAL MARKETING

E-Com@Eu Programme

Work Programme 3

SEVENTH FRAMEWORK PROGRAMME

Report on Behavioural Analysis

From Communication to Behavioural Influence, an Overview of Approaches and Issues

Professor Jeff French

'In the next influenza pandemic, be it now or in the future, be the virus mild or virulent, the single most important weapon against the disease will be a vaccine. The second most important will be communication'

John Barry. The Great Influenza. Nature. May. 2009.

STRATEGIC SOCIAL MARKETING

Content

"We tend to believe that somebody is behaving that way because he wants to behave that way, because he tends to behave that way, because that's his nature. It turns out that the environmental effects on behaviour are a lot stronger than most people expect." Nobel Prize-winning psychologist Daniel Kahneman

Executive Summary

In terms of public health, and specifically in the field of pandemic management the ultimate purpose of communication interventions are focused on increasing awareness, understanding, developing confidence to act appropriately and in the final analysis to impact on behaviour. The challenge is not simply to change behaviour, action is needed to influence the uptake of protective behaviours, action directed at altering current behaviours to reduce harm and action aimed at encouraging the maintenance of positive behaviours.

There is a co-dependency between the impact that vaccines can have in reducing the harm associated with influenza and the processes and systems put in place to influence the behaviour of service providers, influencers in sectors such as the media and the behaviour of individual citizens. It could be argued that influencing behaviour is the most important factor in reducing harm caused by influenza as vaccine uptake depends on the behaviour of health professionals and other influencers as well as the adoption of preventive behaviours on the part of citizens and the availability and access to effective vaccines.

Scope and aims of this paper

This paper does not aim to be a fully comprehensive or systematic review. It is also not a technical guide to behaviour change models or behaviour change planning. The paper is a structured review that seeks to distil in a single document and set out in an accessible way a summary of some of the key insights and principles related to health behaviour change derived from, policy documents, systematic reviews, summary text and selected key academic papers. One practical issue is that the sheer volume of available material of relevance and the technical language of the behavioural science literature over recent decades can present a significant barrier to the uptake and use of developing insights by public health planners and policy makers.

The paper has been developed at a time when many other papers focused on summarising principles of health focused behaviour change have been published and others are being commissioned across Europe. This paper attempts to draw on these publications and the growing body of research on what influences behaviour.

With its focus on capturing and synthesising some of the key learning in the field it is hoped that the paper adds some value by not duplicating past or current efforts to produce behavioural change guidance and reviews. Rather than setting out to be a comprehensive review it is intended that the paper be a helpful summary of the state of play of this field and a starting point for those wishing to develop a greater understanding of how learning from fields of study associated with behaviour change can be applied in pandemic control and management.

The paper also addresses some of the key policy and political influences on decisions regarding programme selection and implementation that tend not to be included in the vast majority of technical and academic reviews and papers referenced in this paper. This is clearly a vital element that needs to be considered in any strategic review of pandemic

communication and management. This discussion covers issues related specifically to the need of public institutes to obtain what Mulgan[1] calls *'public permission'* for state directed actions in the field of pandemic management when issues concerned with the curtailment of personal freedoms and the role of personal responsibility are involved.

The paper goes beyond consideration of just public education and influence to consider implications of professional practice. Influencing the behaviour of professionals and policy makers is a key challenge as their behaviours impact on the delivery of appropriate surveillance, selecting and administering of awareness and behavioural interventions as well as the design and implementation of evidence based influencing programmes.

One of the central conclusions of this paper is that a growing body of evidence and experience indicates that simply providing information and instruction even if it is well designed, communicated and targeted will in many cases be insufficient to bring about a required level of compliance with the key personal behaviours necessary to assist in the containment of pandemic events. There is a great deal of evidence that makes it clear that the public's views and actions related to vaccine acceptance is driven by a mix of access issues but also social, psychological, cultural norms, and access to timely and trusted information. All of these factors need to be understood and taken into account by those responsible for planning for and managing pandemic events.[2] As stated by Heidi et al[3]:

'*Public trust in vaccines is highly variable and building trust depends on understanding perceptions of vaccines and vaccine risks, historical experiences, religious or political affiliations, and socioeconomic status'.*

This paper makes the case and brings together some of the evidence that indicates that whilst the provision of accurate and evidence based information is a vital part of the process of communicating and managing pandemic events[4] information and its communication are seldom enough to ensure full compliance with recommended personal management and vaccine uptake behaviours.

This paper seeks to set out some of the additional Forms and Types of intervention that can be built into communication and broader behavioural change strategies. This work draws on existing and emerging evidence about why people act as they do, the choices they make and how this understanding might be used in the development of a more systematic and effective approach to planning delivering, and evaluation behavioural programmes associated with pandemic events.

This paper also sets out in summary form a brief review of some key theoretical concepts and models that are traditionally used to inform the planning and delivery of some behavioural change programmes. The paper also includes a summary of some of the attempts to produce taxonomies and totalising models of these theories and models and a review of some of the common planning models used to develop communication and behavioural influencing programmes.

The final section of the paper deals with some of the key processes that need to be considered when planning communication and behavioural programmes associated with the management of pandemic events.

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[1] Mulgan Behavioural Insight Team First year annual report. The Cabinet Office 2011.
[2] ECDC Technical Report- A literature review of trust and reputation management in communicable disease Public Health. 2011
[3] New Decade of Vaccines 5 Addressing the vaccine confidence gap. *Heidi J Larson, Louis Z Cooper, Juhani Eskola, Samuel L Katz, Scott Ratzan.* www.thelancet.com Published online June 9, 2011
[4] ECDC Technical report Communication on Immunisation – building trust. 2012.

The core findings of this behavioural review

The complex behaviour challenges associated with pandemic events highlight the limits of conventional communication approaches.
Well researched, well planned and targeted communications programmes are a vital part of all pandemic management and control intervention programmes. However, the tendency to rely on simplistic information transmission and processing models of influence can reduce the impact of these programmes. Some of the new social policy and heath tools that behavioural scientists and others working in the field of behaviour influence have developed based on a growing body of behavioural research summarised in books such as; *Thinking Fast and Thinking slow*[5], *Nudge*[6] and *Influence*[7] have generated a lot of interest amongst many policy makers and planners in government health sector organisations. This new work confirms and makes accessible the understanding that a much wider range of human motivations exist that just rational self-interest based on logical information processing. This new understanding makes clear the need for strategies of influence that go beyond the transmission of factually accurate logical information as the main way to influence behaviour and opinion prior to, during and after pandemic events.

Multiple interventions are more successful.
The effectiveness of single interventions in isolation does not appear to be as great as combining ones that impact on conscious decision making and decisions that are influenced by other mental processes and external factors such as social norms and incentives. Economic instruments can provide the stimulus for change with communication and choice editing shaping successful uptake. (See separate report under Work Programme 3 focused on incentives)

Humans are not entirely rational when making health choices and this understanding needs to be reflected in pandemic programmes.
We do not simply decide on the basis of well-presented information to act in way that demonstrates that they have carefully considered the costs and benefits of an action and then selected the option that results in maximum personal or family benefit. Instead, there are numerous internal and external influences on an individual's behaviour that need to be considered and influenced. If we are to influence health behaviour we need to apply a more sophisticated approach to understanding and developing more comprehensive strategies to influence behaviour that include, but go beyond the transmission of scientifically accurate information to include influencing strategies that target non rational choice. There are clearly considerable ethical issues associated with such approaches that will need to be considered.

Behavioural models and theory can help strengthen the development delivery and evaluation of pandemic communication and behavioural programmes.
One of the tentative conclusions that can be drawn from this review is that theories intended to modify individual level behaviours remain the most commonly applied in pandemic events. Policy and training interventions could be developed to broaden this focus to include ecological theory and models to guide research, intervention design and evaluation. When constructing behavioural interventions the use of several theories and models appears to assist with identifying the key elements which are of most use in either explaining the behaviour or predicting what will influence change. This understanding can be used as the foundation around which communications and messaging can be designed, and other forms and types of influence developed. This is the approach Darnton recommends to

[5] Kahneman D, Thinking fast and thinking slow Macmillan. 2011.
[6] Thaler R & Sunstein C, *Nudge: Improving decisions about health, wealth and happiness,* Penguin 2009
[7] N. Goldstein; S. Martin; R. Cialdini. *Yes! 50 Secrets from the Science of Persuasion*, Profile Books 2007

policymakers [8]. There will be occasions however, when existing behavioural theory is not available or appropriate. In these circumstances it will be necessary to use existing theory and models to build a behavioural framework from scratch to inform programme planning design and evaluation.

It is not sufficient to consider an individual's voluntary behaviour change in isolation. The impact of social, economic and environmental factors have a large influence on people's ability to behave in certain ways and their motivation to do so. The behaviour of others and the general cultural and social environments expressed though notions of social capital and community resilience also needs to be considered and often targeted if individuals are to be helped to sustain a positive behaviour or modify a less healthy behaviour. The role of communication and other forms of behavioural influence such as nudging outlined in this paper focus mainly on changing 'voluntary' behaviour, rather than enforcing behaviour change. However, governments supported by public health institutions in some pandemic situations will need to use tools to 'enforce' rather than encourage behaviour change. **It** needs to be recognised that when the health threat is great governments may need to use different tools to influence people to become compliant including incentives and or sanctions. The use of such tools will also need to be accompanied by communication and behaviour change programmes that seek to engage, explain and involve people in the execution of such non-voluntary change interventions such as fines or restrictions of movement or assembly.

Recommendations

Citizen[9] Focused Solutions.

If the outcome of pandemic communication and behavioural influencing strategies is to achieve a positive, accurate and trusted understanding and experience of government policies related to pandemic management and compliance with recommended actions the approach must be to move away from a top down one way communication dominated model. We need to move towards a model that is based on customer needs, dialogue and feedback with people we seek to influence and an approach that is responsive to demands and changing circumstances. We also need an approach that is focused more on impact and outcome measurement in terms of actual behaviour.

Public Permission Matters.

The more powerful and subtle behavioural change approaches are, the more they may provoke public and political concern. Behavioural approaches that embody a line of thinking that moves from the idea of an autonomous individual making rational decisions to a decision-maker, much of whose behaviour is automatic and influenced by their choice environment raises the question of who decides on and who can influence this choice environment? One of the key challenges that will face public health planners who seek to use no- rational approaches that seek to build relationship influence is how the permission to use these approaches will be given and legitimised in order that a backlash of public opinion does not result in accusations of trickery and manipulation.

The advances in understanding and methodological development in the field of systematic health programmes and behaviour change planning need to be better integrated into pandemic communication and behavioural influence programme management.

[8] Darnton 2008 op.cit.

[9] We use the term 'citizen' to indicate members of the public, the exact word to be used will need to be considered in the light of debate resolution in relation to the issues raised in section two of this paper.

The development of more systematic approach to health behaviour change [10] and a growing body of research[11] that goes beyond communication theory [12] has been developing over recent years[13] [14]. Intervention forms such as social marketing[15], co-creation[16] and community engagement[17] are examples of these new forms of social policy delivery. This development along with more general improvement in social policy implementation[18] planning[19] has resulted in a growing consensus about how to go about establishing, delivering and evaluating more successful behavioural programmes in the social sector. This understanding should be used to shape intervention programmes.

Evidence driven but not evidence restricted.

It is probable that governments and public health agencies will always use some forms and types of intervention that are not fully supported by strong evidence. Interventions such as social advertising should not be dismissed as ineffective, rather government and public health organisations should ensure that they apply best practice when developing these forms of intervention. A culture of systematic planning and evaluation should be encouraged to enable transparent reporting on the impact and efficiency of all programmes. This will help with developing the evidence base[20] for communication and behaviour change interventions in the field of pandemic management. The use of pilot testing should also feature in all programmes.

Cultural and organisational issues, the status of communication and marketing.

Behavioural influence and communications often exists as a bolted on adjunct (all be it a vital one) to the influence of medical and epidemiological understanding in the policy development and strategy development process. Communication and those responsible for influencing behaviour in relevant organisations often operates in an environment where messages and policies are developed prior to and independently from a marketing and communications strategy. This often leads to a producer-led selling approach, i.e. a focus on broadcasting evidence based messages about risk reduction and communication focused on compliance with medical opinion. A significant cultural and technical shift is required within governments and specialist responsible agencies to a more customer-led marketing approach, and a fully integrated partnership between marketing and communications professionals and policy and delivery professionals.

Capacity and Capability.

Marketing practitioners in many governments across Europe have excellent technical skills, but there are many countries where this capacity is not so well developed. There is a need to

[10] Michie S , M van Stralen M ,West R. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implement Sci. 2011; 6: 42. Published online 2011 April 23.
[11] CDC The Community Guide. What works to promote health? http://www.thecommunityguide.org/worksite/supportingmaterials/IES-AHRFAlone.html. CDC Atlanta.
[12] McQuaid D Mass Communication 5th edition Theory Sage 2009
[13] National Institute for Health and Clinical Excellence (2007) *Behaviour change at population, community and individual levels. Reference Guide.* London: NICE
[14] It's our health. National Consumer Council. 2006
[15] French J. Blair- Stevens C. Merritt R. McVey D. Social Marketing and Public health, theory and practice. Oxford University Press 2010

[16] Cottam, H . Leadbeater, C. Red Paper No1 health: Co-creating Services.The Design Council. London. 2004.
[17] *Hills D. 2004 Evaluation of community – level interventions for health improvement: a review of experience in the UK. . HDA. London.*
[18] Good Government. Public Administration Select Committee. (2009) House of Commons London: The Stationery Office Ltd
[19] Australian Public Service Commission (2007) *Changing Behaviour a public policy perspective. Australian Public service Commission.* Barton, ACT: Australian Government Publishers Ltd. 2009.

[20] Applying behavioural insight to health. Cabinet Office Behavioral Insight Team London.2011

continue to build and sustain a high-level of professional capacity and the marketing and communication professional community will need to have the skill-set that will enable them to engage in policy development as well as programme delivery and evaluation if marketing and communications is to be more strategically engaged in pandemic preparedness policy formulation. The implications of adopting such an approach could include countries undertaking a marketing and communications capacity and skills audit and the development of an assistance programme to develop training courses and mechanisms for sharing of best practice and skills and other competences for example, influencing policy makers, stakeholder management and leadership skills.

Budgets and other assets.

All EU countries hold and deploy their own resources alongside neighbouring countries and also the efforts of international regional organisations such as ECDC, CDC, WHO. Annual budget allocations can fuel short-termism. Budgets are also often allocated as a single entity rather than being divided between development, piloting, execution and evaluation. Ideally budgets should be allocated to cover the complete timescale for the planned activity and should be justified not only in terms of achieving quantified objectives and in terms of programme delivery, but also how the activity will contribute to the overall strategy as a whole. The possibility of cross boarder alignment of marketing and communication resources should be investigated to ensure that budget management is optimal.

Silo research and evaluation.

There are no current reliable estimates for how much is spent on marketing and communications research in the field of pandemic preparedness and management across Europe. However, it is reasonable to conclude given the size and importance of the issue to governments that the aggregate figure is significant. Most of this research is commissioned for individual agency programmes rather than for the European common good. The implications of adopting such an approach would include:

- Closer liaison and co-ordination with medical, epidemiological, social and marketing and communications research

- Initiate more centrally/ joint-funded marketing and communications research projects to minimise overlaps and maximise strategic joined up opportunities.

- Use ‘upstream’ horizon scanning and developmental research to pro-actively set the strategic marketing and communications agenda across European countries and specialist agencies.

- Develop standardised procedures for evaluative research to demonstrate the effect of pandemic marketing and communications programmes with the public but also inter and internal organisational communications programmes. This research should develop protocols for process measures of campaign efficiency, impact evaluation i.e. short term change such as awareness, as well outcome measures such as behaviour change or compliance.

"Prevention can be much more cost-effective than cure. Especially when targeted at groups with high risks, prevention can be substantially more cost-effective."[21]

Introduction

Methodology

This paper has been developed under work programme three of the E-com@eu project. It consists of a report on behavioural analysis indicating how new and emerging understanding about influencing behaviour can be used to design behavioural interventions to promote service uptake with reference to pandemic events.

The paper has been developed following an extensive structured but non-systematic review of relevant literature. The project involved a desk-based review of literature including summary of behaviour change reviews, policy documents in the field of pandemic planning and communication, existing pandemic guidance regarding communication and behaviour change, and behavioural change guides. The review focused on the following areas:

Behaviour change models
Behavioural change theory
Behavioural Economics
Social Psychology
Social Marketing
Programme Planning

An indicative topic analysis was performed to define the search terms, and identify potentially relevant disciplines for the topic. This enabled the identification of relevant databases to focus the search strategy. Citation analysis techniques were utilised to identify key seminal works, enabling the collation of an index of key terms which were utilised in behavioural change literature to focus the trawl of the available literature, see table one.

Table 1: Inclusion Criteria

Category	Criteria
Scope	Systematic reviews
	Evidence based reviews
	Meta analyses
Conceptual boundaries	Behaviour change
	Social marketing
	Health improvement
Interventions	Throughout the literature, the concept of attempts to promote or support behaviour change is reflected in a large number of ways. Terms utilised to identify such interventions in this review include: initiative, scheme, action, activity, campaign, policy, strategy, procedure, programme, intervention and project.
Disciplines	Behavioural economics
	Behavioural psychology
	Social psychology
	Social marketing
	Health improvement
	Health promotion
	Health communication
	Public health
Focal points	Pandemic
	Outbreak control
	Outbreak management

[21] Prevention in the curative sector, CPB Memorandum CPB Netherlands Bureau for Economic Policy Analysis, Michèle Belot, 142, 20 January 2006, p.19

Category	Criteria
Scope	Systematic reviews
	Evidence based reviews
	Meta analyses
	H1N1
Language	English
Year of publication	Between 2005 and 2012
Exclusions	Learning disabilities Papers with an explicit clinical or treatment focus or which suggested technical interventions, e.g. tar reduction in cigarettes.

Searches were conducted initially on the Cochrane Database of Systematic Reviews (CDSR), and the Database of Abstracts of Reviews of Effects (DARE) for English language systematic reviews date limited to between, 2005-2012. This enabled the primary identification of systematic reviews from respected sources.

Alongside this search, a number of other academic databases and websites were trawled to ensure broad data capture. A full list of the other academic databases and websites searched is appended at Annexe A. These searches were restricted by additional terms including 'review', 'meta-analysis', 'evidence-based review' or 'systematic review'. In addition, an email was also sent out via a public health academic e-group to identify any relevant 'grey literature', but with very limited success.

Whilst the initial review identified a significant number of studies within the general topic areas, subsequent analysis of the abstracts for these studies showed that the majority of the reviews focused on technical interventions, such as reducing the tar content in cigarettes, or provision of placebos, rather than behaviour modification. Such studies were excluded from this report. See annexe one for further details. In addition to the references listed in annexe one a large number of additional sources of relevant material were identified from more generic search of the literature and published books and governmental reviews. These reviews and papers are inserted as direct footnotes in the body of each section of the paper.

This paper aims to distil from this wide body of behaviour change literature, those elements that are most useful for public health officials and planners working in the field of pandemic management, communication and behavioural influence. The paper is designed not to just explore issues but to develop a set of potential tools that can be used by practitioners and policy makers to further develop pandemic communication and behaviour change programmes. The paper includes:

1. A summary of some of the key research and theory based insights about behaviour and how to influence it.

2. A number of conceptual models that may help those concerned with pandemic management and possibly other public health challenges analyse the strengths and weaknesses of current approaches and model the application of more comprehensive strategies.

3. A discussion of some of the key practical, theoretical, political, policy and ethical issues that need to be considered related to the management and communication of pandemic events. Due to the highly emotive and potentially large impact on public freedoms and the need for personal as well as state responsibility to be harnessed the paper explores and sets out suggestions about how public health officials, politicians and other stakeholders can build new thinking about influencing behaviour in an ethical way into pandemic preparation and management

4. A number of 'checklists', and quick reference summary tools or 'proto tools' for testing in later stages of the E-Com programme have been developed as part of this element of work package 3.

Understanding Behaviour and What Influences It

This paper explores a number of the more common theories and models of behaviour that are used by some more sophisticated approaches to communication and behavioural influence in the pandemic field. However, it is clearly the case that no 'one' theory or model can offer a full explanation or be predictive in terms of behaviour.

"*The psychological literature is extensive and provides a number of general models of health behaviour and behaviour change. However, the research literature evaluating the relevance and use of these models is inconsistent.*"[22]

The range of theories encompasses elements of personal, social and environmental factors. Clearly behaviour and the decisions that impact on it operate in an interactive way. Unlike natural science interventions where cause and effect can often be reasonably demonstrated because it is possible to account for variables. However, given the complex set of interrelated factors that affect dynamic human behaviour that takes place in a fluid environment it is far more difficult to prove cause and effect or to develop strong predictive models or theories. It is also worth noting that behaviour often changes gradually over time and is subject to a constant revision base on learning and environmental circumstances.

> "*Our behaviours are the result of the interaction of our inherent psychological makeup with the knowledge, attitudes, values and behaviour that we acquire, and the ways in which our psychology is influenced by family habits and dynamics, peer pressure, and community, societal and cultural influences. The result is a lifestyle which is not freely chosen but rather is a reflection of the family, community, societal and cultural lifestyle, values and norms in which we are immersed and by which we are influenced*."[23]

A major weakness of the majority of models that are quoted most often in social interventions is the dominant conception of human behaviour as being driven by logic, learning, a desire to maximise personal gain and a considered response to social and environmental influencers. Most models are set out as cause and effect schematics. This paper, however, explores in addition to these models how human behaviour is influenced by non-rational factors including social and psychological factors, environmental prompts, incentives and disincentives, design and emotional responses linked to unconscious choosing and how these can be incorporated into behavioural influencing programmes.

[22] Behaviour Change at Population, Community and Individual Levels, National Institute for Health and Clinical Evidence, October 2007, Page 9

[23] Prevention that Works, A Review of the Evidence Regarding the Causation and Prevention of Chronic Disease Consultation Draft, November 2003 Chronic Disease Prevention Initiative: Paper #2 Prevention and Wellness Planning Population Health and Wellness Ministry of Health Planning Victoria BC

The Underlying Premise of this Paper

The underlying premise of this paper is that there is a need for an expanded communication and behaviour change toolbox that goes beyond the crafting and delivery of well planned and executed communication programmes focused on the transmission of scientifically accurate information. The conclusion of this paper is that those concerned with the management of pandemic events in addition to communication strategies need to develop specific behavioural strategies to complement communication programmes. Whether they like it or not public health professionals and governments concerned with pandemic management and prevention are in the business of influencing behaviour. This paper explores why information is a necessary but not sufficient tool to achieve the aim of effectively influencing behaviour prior to, during and after pandemic events.

This paper sets out a model called D-CIDES[24] that describes five traditional clusters of policy tools that governments can deploy to influence health behaviour. This is a powerful cluster of intervention options but the limitations of even this traditional set of tools is evident in many social policy approaches where we see ineffective or policy failure for example in the fields of obesity, alcohol misuse and drug taking. This paper explores a number of additional ways to influence attitudes, beliefs and behaviours that are emerging from fields of social marketing, behavioural psychology and behavioural economics as well as other fields such as social design.

These emerging additional tools for influencing behaviour that are becoming available to public health specialists and politicians are underpinned by a set of findings from both the fields of economics and psychology that people do not always act in an demonstrable rational way. Extensive work has been completed in recent years that is enabling us to build a more sophisticated and realistic understanding about how people make decisions, express preferences and choose to act in the ways that they do.

This paper looks at recent findings from a variety of fields of study that have all helped to expand and enhance our understanding of how and why people behave as they do and what can influence them to either maintain positive social behaviour or, change undesirable social behaviour. This learning potentially gives us a more powerful set of principles, which can be used to help design more effective social change interventions.

Section seven of this paper explores some of the key evidence that points to the fact that many of the choices and decisions we make that influence our behaviour, are not the result of active considered decision-making. Decisions and choices are often influenced by unconscious and automatic thinking. These 'decisions' are influenced by a range of what appear to be a set of evolutionary derived heuristic systems that interplay with the specific emotional contexts, social influence, environmental prompts, and factors such as timing, and our physiological state. However, we are also capable of making considered rational choices. This paper explores the need for a combination of approaches that include interventions that are focused on the transmission of information that assist professionals and the public undertaking logical considered decision making and approaches that focus more on influencing rapid cognition or what has been called 'mindless choosing'.

This paper sets out a review which suggests that the selection of the appropriate mix of these various 'Forms'[25] of intervention can be enhanced when combined with some of the more traditional policy intervention tools outlined above and also by the use of theory and the application of systematic planning models. All of these approaches are predicted on the

[24] D-CIDES is an acronym for: Control, Inform, Design, Educate, Support.
[25] By Forms we mean different states of considered or rapid cognition. This term is further defined in section XXXXX

need to develop a deep understanding of the attitudes and beliefs of the group or groups that are being targeted.

Much of this new understanding about how to influence behaviour has for many years been used by the commercial sector, often developed through a process of trial and error. What our new evidence based understanding provides are theoretical constructs that can be used to plan future interventions. However, in addition to the application of non-rational forms of influence the business sector has also developed a number of distinct new conceptual and practical methodologies focused on influencing customers that have relevance to pandemic communication and behavioural influence programmes. The business community investments hundreds of millions every year in behavioural change programmes to promote the uptake of goods and services. There is good evidence that business success correlated with investment in this form of marketing and promotion work. The commercial sector over the last fifteen or so years have increasingly focused on three key concepts that are called 'Relationship Marketing'[26] Exchange[27] and 'Service Dominant Logic'[28]. Basically these concepts have moved the commercial sector away from a transactional relationship with clients and customers to a relationship that seeks to build a valued relationship between the service or product provider and the customer based on trust and good service. A considerable factor in this shift has been the need to apply the new understandings about how people can be influenced to behave, i.e. the need to move beyond the purely logical transaction model to one that influences the deeper and more profound influences on behaviour. These concepts have also been extensively used in public health programmes. The commercial sector working in support of public health programmes in the developing world for example focused on issues such as oral rehydration, vaccination uptake and HIV prevention have had many successes through the application of such an approach.

The Responsibility of Public Health Institutions and Planners

The role that behaviour change theories and methodologies can play in the planning and evaluation of public health communications activity is beginning to draw attention from policy makers and professionals [29] [30] [31] [32]. This interest in behaviour and how to influence it is also being developed in many other areas such as the environment[33]. This interest is supported by the growing body of evidence and accumulating experience in fields as diverse as, road safety, energy use, safety and health at work that evidence based, theory informed and well planned and executed behavioural change interventions can potentially make considerable contributions to tackling these problems.

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[26] Gummesson, E. (1987) 'The New Marketing—Developing Long Term Interactive Relationships' Long Range Planning, 20(4), 10–20.
Gummesson, E. (2002) Total Relationship, Marketing Rethinking, Marketing Management: From 4Ps to 30Rs (2nd edn), Butterworth Heinemann, Oxford.

[27] Richard P. Bagozzi: The Journal of Marketing, Vol. 39, No. 4 (Oct., 1975), pp. 32-39Published by: American Marketing Association Stable.

[28] Evolving to a New Dominant Logic for Marketing Author(s): Stephen L. Vargo and Robert F. Lusch: The Journal of Marketing, Vol. 68, No. 1 (Jan., 2004), pp. 1-17Published by: American Marketing Association

[29] Demos/ Green Alliance, *Carrots, sticks and sermons: influencing public behaviour for environmental goals* 2003

[30] French J. It's Our Health. The National Consumer Council 2004.

[31] COI Research Unit, Common Good Influencing Behaviour, Internal Client Presentation. For more information on the Common Good project and forthcoming publications please contact COI Research.

[32] Darnton A Government Social Research Behaviour Change Knowledge Review Reference Report: An overview of behaviour change models and their uses. Centre for Sustainable Development, University of Westminster. July 2008

[33] T *Motivating Sustainable Consumption: A Review of Evidence on Consumer Behaviour and Behavioural Change* A report to the Sustainable Development Research Network, 2005 and Defra, *A Framework for Pro-Environmental Behaviours, Report and Annexes* 2008

Influencing behaviour sits at the heart of any approach to pandemic management be it influencing the behaviour of individuals to protect themselves and others, the behaviour of professionals, the reporting behaviour of the media and many other key social influencers. This issue is clearly not without profound ethical and political considerations. Issues such as at what level of risk should behavioural change approaches be applied that compel people to behave in a certain way or at what level of risk should government go beyond the provision of just information to strategies focused on compulsion. Work in this field is also complex because it seeks to influence behaviour related to risks that are often difficult to convey and quantify and risks that are likely to change rapidly over time as was the case with H1N1 in 2009.

It is clear that institutions and individuals who shoulder the responsibility for advising governments and policy makers and who are responsible for delivering information and advice to the public have a professional duty to develop the most comprehensively possible understanding of what influences behaviour and how this understanding can be practically applied. This paper seeks to make a small contribution to this field.

"Too often, people create an elegant plan around the wrong premise or the wrong goal." "A successful programme, no matter how we define it, has got to begin with very clear, realistic, measurable goals," says Barbara Beck of the Pew Charitable Trusts. "Campaign goals that are not explicit and realistic"[34]

[34] Now Hear This, 2001, Fenton Communications • 1320 18th Street, NW, Washington DC 20036 • 202-822-5200 • www.fenton.com. Sponsored by the David and Lucile Packard Foundation

The Behavioural Challenges Posed by Pandemic Threats

The Scale of the 'Wicked Problem'

Behaviour change programmes require a set of clear measurable and sensible behavioural objectives that need to be achieved in the timescales of the programme. Often many governmental public health programmes have unrealistic, or, in the opposite extreme, no objectives. These objectives need to be based on thorough research on what is achievable and realistic. In 2010 WHO guidance[35] on developing an integrated communication strategy for the distribution of vaccine set out the scale of the challenge and the role of vaccines can play in reducing the harm associated with H1N1 ;

> " *In June 2009, WHO declared the first influenza pandemic in over 40 years. Since then, the H1N1 pandemic has spread to almost all countries, but has resulted in mild illness and moderate overall impact in most cases. Nevertheless, experience so far has shown that H1N1 can place a considerable strain on health services and can result in serious illness and death. Young people, pregnant women and those with chronic diseases seem to have the highest rate of complications."*

In addition to this warning WHO also predicted that developing countries were likely to be at most risk from the pandemic effects, as they faced the dual problem of highly vulnerable populations and limited resources to respond to H1N1.

WHO statistics indicate that the 2009 H1N1 virus has killed more than 18,000 people, however, WHO feel that total mortality (Including deaths unconfirmed or unreported) from the H1N1 strain is 'unquestionably higher'[36]. As many as 579,000 people could have been killed by the disease, as only those fatalities confirmed by laboratory testing were included in most calculations; many of those without access to health facilities therefore went unrecorded. The majority of these deaths occurred in Africa and South East Asia[37] [38]. One of the key concerns for those in charge of planning prevention and service delivery is the unpredictable nature of the pandemic combined with the potential, enormous impact on health and services ability to cope if the severity of the virus is high. A number of modelling programmes have been developed such as the CDC "FluSurge" [39] software programme, to assist planners and hospital managers. It estimates the number of hospitalisations and deaths that would occur during an influenza pandemic. "FluSurge" compares the number of people hospitalized, the number requiring treatment in the intensive care units (ICU), and the number requiring ventilators to a community's existing supplies in different levels threat.

[35] Integrated Communication Strategy for Distribution of the H1N1 vaccine Developed by WHO/H1N1 Communications Team and Societal and Individual Measures Team in consultation with Regions and Partners February 2010 WHO.

[36] Pandemic (H1N1) 2009 – update 100". Disease Outbreak News (World Health Organization (WHO) 14 May 2010. Archived from the original on 18 May 2010 Retrieved 14th May 2010.

[37] Dawood Iuliano, et al. The Lancet Infectious Diseases, Early Online Publication, 26 June 2012 PMID 227388933 doi:10.1016/S1473-3099(12)70121-4 'Estimated global mortality associated with the first 12 months of 2009 pandemic influenza A H1N1 virus circulation: a modelling study.

[38] First Global Estimates of 2009 H1N1 Pandemic Mortality Released by CDC-Led Collaboration CDC Spotlights http://www.cdc.gov/flu/spotlights/pandemic-global-estimates.htm

[39] http://www.cdc.gov/flu/tools/flusurge/

Predictions based on the city of Atlanta for example. Estimated impact is shown in the table below:

	LOW IMPACT	HIGH IMPACT
Total number infected	38 million	90 million
Outpatient hospital visits	18 million	42 million
Hospitalized	314,000	734,000
Deaths	89,000	207,000
Estimated economic impact	$71.3 billion	$166.5 billion

A guide for managers starkly sets out the implication of these estimates[40] *"These figures indicate that an influenza pandemic might overwhelm existing hospital resources, especially given that modern western hospitals increasingly operate at nearly full capacity".*

The potential stress on resources could be even more severe in countries with less well developed systems. Health sector workers need to be prepared for the worst-case scenario, pandemic events such as the 2009 H1N1 place a great deal of strain on health care systems and workers. They also place a great deal of stress on public health systems communication and prevention services concerned with keeping citizens and professionals informed about what is happening and providing advice and support to undertake appropriate behaviours to mitigate the effects of the infection.

One of the notable features of the response were the numerous media and policy critics of the way that WHO, other regional and national public health organisations responded to the outbreak in terms of service provision but especially with regard to public information, awareness and engagement. The WHO Europe review of good practice in preparedness found six consistent major themes, considered by respondents across Europe to have been essential elements of successful PPA: These included well planned and executed communication, co-ordination; capacity development, adaptability/flexibility of response, leadership; and mutual support. Generally systems had worked well but multi-sectorial involvement, political support and dedicated funding emerged as important success factors. In addition the review recommended that a greater emphasis still needs to be placed on improving planning for the communications element of the programme and intersect oral co-ordination.[41]

With regard to communication attempts to influence behaviour there are two types of community-level communication interventions undertaken: mass media campaigns and educational programmes directed at health care workers. In the case of the 2009 event according to WHO[42] the campaigns included a range of interventions from hand hygiene, use of masks through to pandemic vaccine use. Key issues regarding communications included information-sharing among countries and the role of the media and the "importance of messages being delivered by prominent people in the community". The report goes on to assert that. The strategies utilized during the influenza pandemic 2009 included 'speaking with one voice', involving academic experts and government officials in the effort, and targeting core groups of at risk populations.

[40] The Work Place Guide for Managers, Avian influenza Prepared for the USAID Avian Influenza Program by the Academy for Educational Development. U.S. Agency for International Development www.usaid.gov. 2010

[41] Recommendations for good practice in Pandemic Preparedness, Identified through Evaluation of the response to pandemic (H1N1) 2009. WHO Europe. Nottingham University 2010.

[42] Public health measures during the influenza. A (H1N1)2009 pandemic. Meeting Report. WHO Technical Consultation. Gammarth, Tunisia 26 28 October 2010.

"Campaigns included mass media and digital awareness raising, advocacy, call centres, on-line response capacities and multi-ministerial, NGO and private sector partnerships. Who concludes that; "There is still a need for specific guidelines and manuals and a need for care in naming the disease in order to avoid creating anxiety and panic".

WHO also emphasise the complexity of the challenge both developing and co-coordinating effective interventions and evaluation of their impact; "Conducting well designed studies in this field is challenging….. Due to ethical considerations, it may be difficult to design studies employing a control group that does not use any protective equipment including masks/respirators given such precautions are routinely recommended for pandemic and seasonal influenza. Given the study limitations, the difficulties in conducting studies, and the fact that there are differences between the diseases that have already been studied and new emerging diseases, it is not possible to make real-time evidence-based recommendations without a larger evidence base."

What is clear is that one of the main communication and behavioural influence challenges of such events is that they exhibit a number of specific features in terms of social challenges that Rittel and Webber[43] have called 'Wicked Problems'. The sheer complexity of influencing behaviour is also evident from the breadth of research and reviews from a wide range of academic fields that can be brought to bear on the challenges, see Annexe one.

The term 'Wicked' in this context is used, not in the sense of evil, or doing harm, rather Rittel and Webber used this description to encapsulate the large number of social challenges and planning problems that cannot be successfully treated with traditional linear, analytical approaches and simple informational or legislative responses. Rittel and Webber used the label; 'Wicked Problems' to describe these challenges and contrasted them with 'Tame Problems'.

'Tame problems' are not necessarily simple—they can be very technically complex—but the problem can be tightly defined and a solution fairly readily identified or worked through based on a limited number of variables that can be controlled and models of cause and effect . Solutions are primarily developed based on natural science and or engineering solutions that can be empirically developed and monitored. 'Wicked problems' unlike 'Tame problems' are more complex, difficult to define and often involve many variables. The nature and extent of the problem also depends on who has been asked to define it and possible solutions. Different stakeholders often have different interpretations of what the problem is and how to deal with it and in what priority order. Often, each version of the problem has an element of truth—no one version is complete or verifiably right or wrong. The debate concerning the causes, the extent and scale of the threat and the priority assigned to potential solutions are all debatable amongst stakeholders and the public.

Clearly the field of public health prevention in relation to outbreaks contains some elements of 'Tame problems' in as much as there is a great deal of science based technical understanding about issues such as vaccine development and immunisation however, because there are many stakeholders with differing views about how the issue is best tackled they can also be labelled as 'Wicked Problems'. Rittel and Webber set out the following characteristics of 'wicked problems' [44]

[43] Rittel, Horst, and Melvin Webber; "Dilemmas in a General Theory of Planning," pp. 155–169, Policy Sciences, Vol. 4, Elsevier Scientific Publishing Company, Inc., Amsterdam, 1973. Re printed in N Cross (ed.), Developments in Design Methodology, J. Wiley & Sons, Chichester, 1984, pp. 135–144.]

[44] Tackling 'Wicked Problems' A Public Policy Perspective Australian Government. The Australian Public Service Commission.

'Wicked problems' have many inter-dependencies and are often multi-causal. There are also often internally conflicting goals or objectives within the broader 'wicked problem'. It is the interdependencies, multiple causes and internally conflicting goals of 'wicked problems' that make them hard to clearly define. The disagreement among stakeholders often reflects the different emphasis they place on the various causal factors. Successfully addressing wicked policy problems usually involves a range of co-ordinated and interrelated responses, given their multi-causal nature; it also often involves trade-offs between conflicting goals.

Attempts to address 'Wicked problems' often lead to unforeseen consequences. Because wicked policy problems are multi-causal with many interconnections to other issues, it is often the case that measures introduced to address the problem lead to unforeseen consequences elsewhere. Some of these consequences may well be deleterious. It has been asserted, for example, that the success of policies designed to reduce atmospheric pollution in the USA and Western Europe may be partly responsible for an apparent increase in global warming due to the impact of a reduction in sulphur particles in the atmosphere on the formation of clouds that trap heat in the atmosphere.[45]

'Wicked problems' are often not stable. Frequently, a 'wicked problem' and the constraints or evidence involved in understanding the problem (e.g. legislation, scientific evidence, resources, political alliances) are evolving at the same time that policy makers are trying to address the policy problem. Policy makers have to focus on a moving target.

'Wicked problems' usually have no clear solution. Since there is no definitive, stable problem there is often no definitive solution to wicked problems. Problem-solving often ends when deadlines are met, or as dictated by other resource constraints rather than when the 'correct' solution is identified. Solutions to 'wicked problems' are not verifiably right or wrong but rather better or worse or good enough. To pursue approaches based on 'solving' or 'fixing' may cause policy makers to act on unwarranted and unsafe assumptions and create unrealistic expectations. In such cases, it may be more useful to consider how such problems can be best managed.

'Wicked problems' are socially complex. It is a key conclusion of the literature around wicked problems that the social complexity of wicked problems, rather than their technical Complexity overwhelms most current problem-solving and project management approaches. Solutions to 'wicked problems' usually involve co-ordinated action by a range of stakeholders, including organisations (government agencies at the federal, state and local levels), non-profit organisations, private businesses and individuals.

'Wicked problems' hardly ever sit conveniently within the responsibility of any one organisation.
Even if the solution to achieving safer communities is opaque, it is clear that it involves organisations beyond the police. It is also clear, for example, that environmental issues cannot be dealt with at any one level of government. They require action at every level—from the international to the local—as well as action by the private and community sectors and individuals.

'Wicked problems' involve changing behaviour. The solution too many "wicked problems" involves changing the behaviour and/or gaining the commitment of individual citizens. The range of traditional levers used to influence citizen behaviour—legislation,

[45] 2 Discussed in L. Briggs and R. Fisher, 'Fashions and Fads in Public Sector Reform' (Paper prepared for the CAPAM Conference, Sydney, October 2006), p. 18.

fines, taxes and other sanctions is often part of the solution but these may not be sufficient. More innovative, personalised approaches are likely to be necessary to motivate individuals to actively co-operate in achieving sustained behavioural change.

In addition to these characteristics the case is made by Rittel and Webber that 'wicked problems' can only be tackled if a full range of stakeholders are engaged in both defining the problem and the search for and delivery of solutions. Critically for pandemics and the associated public health management, public and professional engagement is critical because the active participation and co-operation of citizens and staff are required to deliver effective interventions. A further complexity comes from bringing about changes in the way people behave, cannot readily be imposed, in advanced democracies for reasons of ethics and public acceptability in terms of fundamental civic rights and respect for personal freedoms. We also know that behaviours are also more likely to change if issues such as risk and how to behave to reduce risks are widely understood, and owned by the people whose behaviour is being targeted. Solving a 'wicked problem' is fundamentally a social process. A starting point is stakeholder and citizen engagement.

The OECD [46] identifies three levels of government-citizen relations in this context:

• *Information.*
Government disseminates information on policy making or programme Design and information flows from the government to citizens in a one-way relationship.

• *Consultation*.
Government asks for and receives feedback from citizens on policy-making and programme design. In order to receive feedback, government defines whose views are sought and on what issues. Receiving citizens' feedback also requires government to provide information to citizens beforehand. Consultation thus creates a limited two-way relationship between government and citizens.

• *Active participation or citizen engagement*.
This occurs where citizens actively engage in policy and decision-making processes. Citizens may propose policy options and engage in debate on the relative merits of various options, although the final responsibility for policy formulation and regulation rests with the government. Engaging citizens in policy making and programme design is an advanced two-way relationship between government and citizens based on the principle of partnership.

The OECD also endorses some basic principles as set out by Canada's Institute on Governance [47] upon which active participation (or citizen engagement) is based. These include:

- Shared agenda-setting for all participants
- A relaxed time-frame for deliberation
- An emphasis on value-sharing rather than debate
- Consultative practices based on inclusiveness, courtesy and respect.

Successfully addressing 'wicked problems' often requires achieving sustained changes

[46] OECD 2001, *Citizens as Partners: Information, Consultation and Public Participation in Policy-Making*, OECD, Paris, pp. 23, 24, 28.

[47] Institute on Governance 1998, *A Voice for All: Engaging Canadians for Change* (Report (including Summary of Findings) of the Conference on Citizen Engagement, Ottawa, 27–28 October), p. 25 http://www.iog.ca/publications/cereport.pdf

in behaviour. Human behaviour is also often influenced by a complex web of factors. Influencing behaviour is a multi-faceted field of study and application that draws on a wide range of disciplines, research and experience. The effectiveness of traditional policy and public health approaches to influencing behaviour (e.g. legislation, sanctions, regulations, taxes, subsidies, incentives and the provision of health care and preventive interventions such as vaccination) may be limited, without additional tools and understanding of how to engage citizens and health sector staff in developing co-operative behavioural change. A key further behavioural challenge related to this point is how to achieve shared understanding and inter agency co-operation and co-ordination amongst the many organisations and staff groups from international through to local service delivery level. Co-operation with other sectors such as the media and civic planning and emergency services is also a large communication, engagement and behavioural challenge.

A number of governments are now actively looking at emerging findings from the field of behavioural influence and understanding to augment traditional policy tools used to influence behaviour. Many governments have a growing policy interest in engaging citizens to achieve sustained behavioural change to assist in tackling 'wicked problems'. For example the UK Government established in 2010 a 'Behavioural Insight Team' led by the Cabinet Office focused on developing new approaches to policy delivery based on insights and emerging research from fields such as behavioural economics, evolutionary biology, social psychology and design thinking. The purpose of this unit is to:

- Exchange experience of behavioural change policies and their implementation
- Pool research and policy evaluation on behavioural change
- Disseminate research findings and good practice across government
- Advise on and promote common policy tools and support for those engaged in behaviour focused policies.

In a similar manner the Australian Public Service Commission has recently published a discussion paper, *Changing Behaviour: A Public Policy Perspective* [48] that outlines the key theories and empirical evidence about behavioural change and draws out the implications for improving policy making and programme implementation. The US government has engaged the Authors of the popular book 'Nudge'[49] to act as advisors on several policy areas.

The Canadian Government has also been actively interested in the area of behavioural change and has produced a set of guidelines known as the 'Tools of Change' for altering public behaviour around 'wicked problems' in the environmental and health areas. These guidelines can be found at <http://www.toolsofchange.com>.

What is clear is that given the complex nature of both public health policy making when dealing with 'wicked problems' and the complexity involved in both understanding and developing programmes that can achieve positive civic behavioural change to assist in tackling a 'wicked problem' a basic understanding is required of key determinants of behaviour and what is known about how to influence it.

[48] Australian Public Service Commission 2007, *Changing Behaviour: A Public Policy Perspective* http://www.apsc.gov.au

[49] Thaler R and Sunstein C. *Nudge. Improving Decisions about Health, Wealth and Happiness.* New Haven & London: Yale University Press. 2008.

The Behavioural Challenge Associated with the Complex Matrix of:

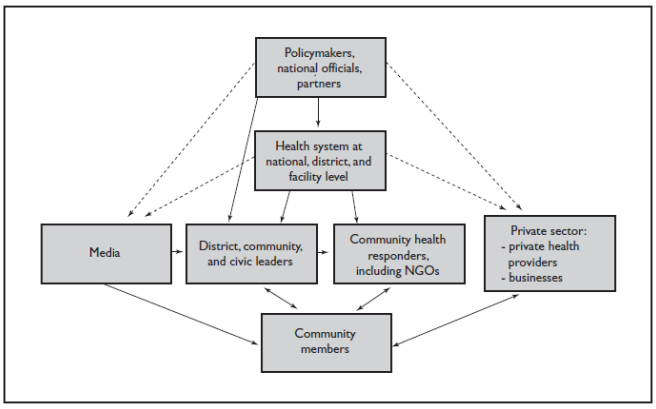
Target Audiences, Pandemic Stage and Threat Level.

Communication and behaviour change in relation to pandemic influenza aims to make a contribution to overall efforts to help people overcome fear, anxiety and reduce feelings of vulnerability [50]It can also assist people to make informed decisions and ultimately save lives[51]. It also has a broader contribution to managing potential political instability and economic impacts that may follow on from a severe outbreak [52]. Regardless of how pandemic events are conceived what is clear is that the communication and behavioural challenges associated with managing outbreaks and minimising harm are considerable due to the wide range of information issues that need to be addressed and the equally wide range of behaviours amongst different target groups that need to be influenced and the shifting nature of both information and behavioural change programme during differing phases of an outbreak. The following list of factors all need to be addressed:

- Essential information developed, transmission and understood across all phases of an event
- Behaviours specified, communicated and acted on across all phases of an event
- Target audiences identified and targeted (Organisational, sectors, professional and citizen audiences) across all phases of an event

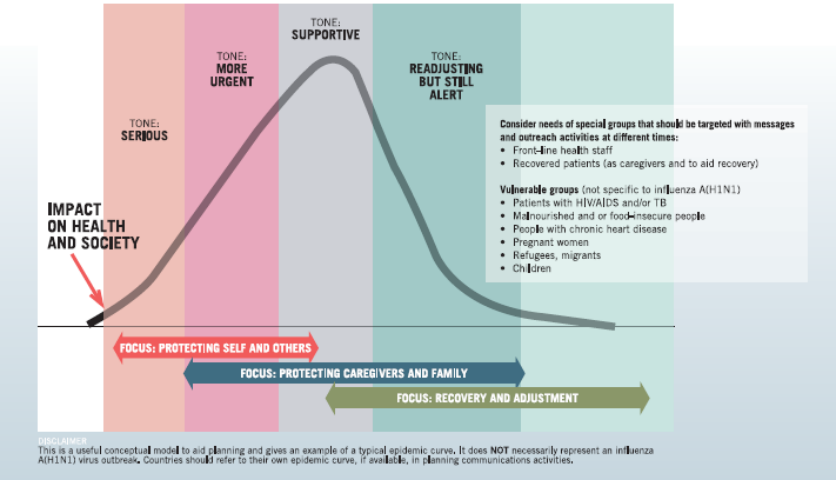
Diagram1 from the US AID planning strategic behaviour change communication for pandemic influenza guidance document [53] sets out the range of types of communication and relevant target groups that need to be involved with developing and delivering a planned response.

Diagram1: Key target groups and flow of information



[50] Pandemic Influenza, Preparedness and Response. WHO Guidance Document. Geneva, World Health Organization, 2009.
[51] WHO and UNICEF Behavioural Interventions for Reducing the Transmission and impact of Influenza A (H1N1) virus: A framework for communication strategies. Geneva, World Health Organization, 2009.
[52] WHO/UNICEF An Informal Discussion on Behavioural Interventions for the next Influenza Pandemic. Bangkok, World Health
Organization and UNICEF 2006 (http://www.unicef.org/avianflu/files/WHO_UNICEF_API_Mtg_Bangkok_Dec 06. pdf, accessed 23 November 2010).
[53] US AID planning Strategic Behaviour Change Communication for Pandemic Influenza. US AID AICOM 2009.

Diagram 2 taken from WHO and UNICEF guidance[54] indicates the need for a shifting tone of communication during different phases of an outbreak. Depending on the severity of the outbreak there would also need to be a change in the behavioural goals of a programme.



A review completed as part of the wider E-Com programme has reinforced the need for a flexible approach to communication over the phases of an outbreak. The review [55] found that public perceptions and behaviours evolved during the course of the 2009 pandemic. In most countries, perceived severity and anxiety declined, but perceived vulnerability increased. High levels of perceived self-efficacy and intention to take preventive measures were observed. Improved hygienic practice and social distancing was practiced most commonly, but vaccination acceptance remained low in most countries. Marked regional differences were also noted.

A review by Bish and Michie [56] has also highlighted that demographic and attitudinal factors can have a big influence on the adoption of protective behaviour during a pandemic. Being older, female and more educated, or non-white, is associated with a higher chance of adopting the behaviours. “There is evidence that greater levels of perceived susceptibility to and perceived severity of the diseases and greater belief in the effectiveness of recommended behaviours to protect against the disease are important predictors of behaviour. There is also evidence that greater levels of state anxiety (i.e. anxiety felt at that moment), and greater trust in authorities are associated with an increased chance of behaviour being carried out”.

Findings such as this clearly have major implications for communication and behaviour change strategy. For example, the need to adapt behavioural influencing and communication programmes for specific groups of individuals, such as men, younger people, and the less

[54] Behavioral interventions for reducing the transmission and impact of influenza A (H1N1) Virus Framework for Communication Strategies WHO /UNICEF 2009

[55] Bults M, Beaujean D, Richardus J H, Voeten H. Perceptions and Behavioural Responses of the General Public during the 2009 Influenza A (H1N1) Pandemic: a systematic review (In Press) 2012.

[56] Bish and Michie (2010) Demographic and Attitudinal Determinants of Protective Behaviours during a Pandemic: a review. *British Journal of Health Psychology*. DOI:10 1348/135910710X485826.

well educated. The need to focus on perceptions of risk in communications as susceptibility is a key factor in decisions to act. In this respect a certain level of perceived susceptibility is required to get people to take action and therefore interventions aimed at increasing this sense of risk appear to be well founded. However, ethically interventions designed to emphasis perceptions of risk should also be combined as Bish and Michie say with "advice as to how the perceived threat can be lessened; for example, by emphasising that risk can be reduced by carrying out the recommended protective actions and providing information about the efficacy of such measures in reducing risk"

It is therefore necessary to develop sets of communications guidance with specific objectives related to each identifiable target group at each stage of an outbreak. A complex planning task is possible to develop such comprehensive plans, for example the WHO & PAHO staged guidance [57] and guidance from AED[58]

While all strategies will need to focus on communication and behaviour change activities needed during an outbreak, preparation is also needed to ensure that these activities take place in a co-ordinated and planned way with actions delivered over other phases of an outbreak for example actions in the pre-pandemic preparedness phase such as briefing of key influencers and developing strong partnerships with the private and media sectors. Additional modified communication is also likely to be needed between 'waves' of local outbreaks.

It is also necessary to develop and set out clear behavioural objectives related to both general population level behaviour and specific sub group behaviours. With regard to the public WHO[59] recommends that the key population level behaviours that need to be influenced in addition to uptake of vaccine, when offered include:

- Keep at least 1 metre distance from people who show symptoms of influenza-like illness.
- Reduce the time spent in crowded settings.
- Improve airflow in living spaces by opening windows.
- Avoid touching mouth, nose and eyes if possible.
- Clean hands thoroughly with soap and water or with an alcohol-based hand rub on a regular basis.

Further more specific behavioural goals have been spelled out by WHO and UNICEF[60] with regard to public reduction of transmission.

[57] Creating a Communication Strategy for Pandemic Influenza. Produced by the Pan American Health Organization. WHO 2009.
[58] The AI COMM Project. Conceptual Framework for Avian and Pandemic Influenzas and Other Emerging Infectious Diseases. AI COMM . AED Washington, DC 20009

[59] World Health Organisation. What can I do to protect myself from catching Pandemic (H1N1) 2009 http://www.who.int/csr/disease/swineflu/frequently_asked_questions/what/en/index.html (27.11.2010).
[60] Behavioral interventions for reducing the transmission and impact of influenza A (H1N1) Virus A framework for Communication Strategies, WHO UNICEF. 2009

Behavioural Goal:
If well, how to avoid becoming infected, if sick, how to avoid infecting others.

Behaviours:
- *Keep your distance from someone who is coughing.*
- *Stay home if you feel ill.*
- *Cover your coughs and sneezes.*
- *Wash your hands with soap and water.*

Behavioural Goal:
Protect care givers and other members from infection. Aid recovery from illness

Behaviours:
- *Give sick people a separate space at home*
- *Assign a single care giver to a sick person*
- *Give plenty of fluids to the sick person*
- *Recognise signs and seek prompt care*

This set of behaviours are challenging in that they represent a set of potentially difficult set of changes for many to achieve. Each of these stated behaviours in fact also consists of a cluster of distinct sub behaviours that will need to be influenced. In addition, each behaviour may require distinct interventions that need to be delivered in targeted and tailored ways to differing segments of the population.

The challenge of vaccine uptake also represents a cluster of behavioural challenges. The delivery of an effective vaccination campaign involves a co-ordinated response from a range of different stakeholders. Communication programmes play a crucial role in informing the stakeholders about a pandemic and about the vaccine and its benefits. Information alone will probably not however, be sufficient to ensure the successful distribution and uptake of the vaccine among the priority groups.

As stated by WHO[61] "For people to make informed decisions about preventive and risk reduction practices, including taking the vaccine, a more integrated approach is needed – focusing on achieving behavioural results. This is why this proposed strategy includes elements of both risk communications (often done through the media) and social mobilization[1] (using multiple communications means and methods to influence, persuade, convince individuals and groups to take action)".

Different stakeholder groups will need different communication, engagement and behavioural change programmes. For example, a mass media campaign can be an efficient way to inform a population about dangers, but it is probably not a good way to give technical information about how to administer the vaccine. There are obviously numerous specific target groups and sets of behaviours that need to be influenced, for example in relation to people planning or needing to travel [62].

[61] Integrated Communication Strategy for Distribution of H1N1 vaccine Developed by WHO/H1N1 Communications Team and Societal and Individual Measures Team in consultation with Regions and partners. 2010
[62] USAID Workplace guide to Managers Avian Flu. USAID Avian Influenza Program by the Academy for Educational Development. 2010

As described above the behavioural and communications challenges posed by pandemic events are considerable and complex. This complexity necessitates the need for the development of integrated community wide communication and behaviour change programmes.

The Need for Integrated and Evidence Based Community Wide Strategies

Any communication programme that is developed will involves a range of different actors and stakeholders, from those directly involved in and to those who play a supporting role. Information and mass media campaigns play a crucial role in informing these different stakeholders about pandemics and about the vaccines and there benefits. This will, however, as discussed previously probably not be sufficient to ensure the successful uptake of recommended behaviours or the optimal distribution and uptake of the vaccine among the priority groups. For people to make informed decisions about preventive and risk reduction practices, including taking the vaccine, a more integrated approach is needed – focusing on achieving clear behavioural goals. A communication strategy and a behaviour influence strategy are important planning and implementation tools, which describe how to reach a defined set of measurable objectives.

In addition to the principles and goals set out above the central focus is on influencing human behaviour, so that people carry out appropriate actions to protect themselves from becoming infected and from infecting others. [63] These can be defined as:

1. Explaining a new virus and its risks to a wide audience.
2. Explaining the vaccine, assuring the public that it is safe.
3. Communicating when and where vaccine is available, and to whom.
4. Managing over-demand and under-demand for the vaccine.
5. Addressing health-care workers' concerns.
6. Addressing concerns from other target groups, particularly pregnant women.
7. Managing adverse events.
8. Managing trust in institutions.

Within this shifting context, the communication and behaviour change challenges posed by pandemic events should according to WHO be focused on five key communication action areas.[64]

(a) Mobilizing administrative structures/advocacy/mass media.

(b) Mobilizing communities.

(c) Interpersonal communication/personal selling.

(d) Promotional material and advertising.

(e) Point-of-service promotion.

[63] Integrated communication strategy for distribution of H1N1 vaccine Developed by WHO/H1N1 Communications Team and Societal and Individual Measures Team in consultation with Regions and partners February 2010

[64] WHO communication-for-Behavioural-Impact: 2010.

In addition to these five key communication areas there are many guidelines for developing behavioural change interventions in the context of H1N1[65]. The majority of these guidance documents articulate the need for communication and behaviour change programmes that reflect the reality of a complex set of stakeholders, potential target audiences, a variety of behaviours to be influenced and the dynamic and changing nature of pandemic events where understanding and threat levels will shift over time.

WHO have set out further guidance relating to general communications objectives for a pandemic influenza response[66]

1. Instil and maintain public confidence in public health interventions, institutions and personnel.

2. Reinforce the international co-ordination and co-operation under pinning the response effort.

3. Provide information in a timely and appropriate manner.

4. Promote compliance, participation, ownership in control measures.

5. Address inaccuracies/rumours to minimize stigmatization and fear.

6. Prepare for a possible pandemic.

These guides for communication and behavioural influence recognise that communication cannot be a stand-alone intervention when addressing a public health concern such as reducing transmission of influenza because of the strong sociocultural influences on behaviours and the influence on behaviour of other areas of policy such as the availability and access to vaccination and other well-being programmes and health service provision. The general approach to behaviour change has changed in recent years from one focused on paternalistic information transmission to one that is more characterised by making communications more of an inclusive and horizontal process in which both senders and receivers of information take on interchangeable roles, through a process that involves out-reach on the part of institutions and active engagement on the part of citizens. Communication has changed its focus from "persuasion" to what has been called "participatory communication" [67] where information is created and shared between participants to reach a mutual understanding and collective decision-making.

This kind of approach seeks to examine and address predisposing, enabling and reinforcing factors associated with behavioural change which also includes, in addition to addressing cultural values and beliefs, government policies and legislations, partnership building, resource mobilization and generating evidence of the effectiveness of the approach through research, monitoring and evaluation. As discussed above the timing of communication is also a key issue to be considered. Messages can be most effective when the public feel that they have been involved. However, the time to explain complex issues such as antiviral efficacy or vaccine prioritisation is not best delivered during an emergency situation but

[65] Creating a Communication Strategy for Pandemic Influenza .Pan American Health Organization/World Health Organization. 2008.
[66] Communication for Pandemic Influenza Response. May 2009.
[67] Guidance on Health Promotion and Education (HPE). The Department of Non-Communicable Diseases and Mental Health. WHO Office South East Asia. 2008.

rather it should be built into action in the preparation periods when there is ample time to develop listening and engagement elements of programmes.

With regard to the state of the evidence about how to develop and deliver the most effective communication and behavioural influence strategies the UK Department of health scientific review of principles of effective communication[68] recommends the following planning principles be adhered to :

Openness/Transparency-*be open about:*

- *Likely course of incident.*
- *How incident is being handled.*
- *What people can do to protect themselves.*

Clear and simple communication:

- *Ensure new terms are explained.*
- *Be sensitive to cultural differences.*
- *Ensure messages are scientifically accurate.*

Acknowledge uncertainty:

- *Acknowledge that the course of the pandemic is uncertain.*
- *Ensure messages from different sources are consistent.*

The guidance also focuses on the general issue of communicating about risk
The report concludes that the representation of risk information is important as it can affect whether or not action will be taken. The report sets out a number of 'golden rules' applying to communicating about risk.

The Golden rules are:

- Always give absolute as well as relative risk. For example, 'Pregnant women are four times as likely to develop complications from swine flu as non-pregnant women. Of 1,000 pregnant women *n* would develop complications whereas of 1,000 non-pregnant women *n* would develop complications'.

- Present messages about risk using natural frequencies (e.g. out of 100 people 10 will experience side effects) as opposed to probability frames (the risk of experiencing side effects is 10%).

- Frame ambiguous messages about risk negatively. For example "it is estimated that out of every 100 people 20 to 30 will contract swine flu" (as opposed to saying "out of every 100 people 70 to 80 will *not* contract swine flu").

- Present risk information visually as well as textually whenever possible.

The change in emphasis from paternalistic expert information transmission and the acceptance that it is more effective to adopt a balanced and open approach to communication risk is partly driven by research that indicates that trust is a key element in compliance with recommended behavioural adoption and that trust can be fostered by both open communication but also by the

[68] Bish A, Michie S. Yardley L. Principles of Effective Communication Scientific Evidence Base Review. The Department of Health. Scientific Pandemic Influenza Advisory Committee (SPI). Department of Health.2010.

active engagement of target abundance groups in the design, development, implementation and evaluation of change programmes.

The Role of Trust in State and Citizen Driven Communication

One thing is clear the only certainty is that future influenza pandemics will happen and they will be unpredictable [69] Slovic[70]has shown that trust is a key emotion associated with responses to risk related behaviour. Slovic also points out that trust is fragile and difficult to maintain, being easily broken because negative events, which can destroy trust, are more noticeable than positive events and as Bish and Michie[71] state:

"Levels of trust and satisfaction with communication are particularly important in a pandemic situation in that the authorities are responsible for providing information about the course of the outbreak and also for developing treatments and vaccinations. Lack of trust can therefore have very detrimental effects in terms of controlling the disease."

Low trust in the organisations responsible for communication during a pandemic will have a big impact on how people react to messages and advice about how to behave. Lack of trust is also likely to increase concern and to interfere with the way that the risk messages are interpreted and acted on[72] [73]. It has been found[74] that during the 2009 outbreak of swine flu that trust in authority was associated with reported avoidance behaviours, such as avoiding crowds and public transport. Research has also found that older adults with greater trust in authorities to contain the spread of SARS were more likely to adopt precautionary behaviours[75]. Issues of trust can be especially important in situations which are uncertain, such as how the course of a pandemic will develop. With regard to vaccine acceptance Larson[76] et al endorse these findings and make the point that peoples decision making related to vaccine acceptance is driven not just by scientific or economic evidence, but by a mix of psychological, sociocultural, and political factors, all of which need to be understood and taken into account by policy and other decision makers.

"Public trust in vaccines is highly variable and building trust depends on understanding perceptions of vaccines and vaccine risks, historical experiences, religious or political affiliations, and socioeconomic status. Although provision of accurate, scientifically based evidence on the risk–benefit ratios of vaccines is crucial, it is not enough to redress the gap

[69] Fineberg Preview of the Report of the Review Committee on the Functioning of the International Health Regulations (2005) and on pandemic influenza A (H1N1) 2009 March 2011. http://www.who.int/ihr/preview_report_review_committee_mar2011_en.pdf.

[70] Slovic, P. (1999). Trust, Emotion, Sex, Politics and Science: Surveying the Risk-Assessment Battlefield. *Risk Analysis, 19 (4),* 689-701.

[71] Bish A, Michie S. Yardley L. Principles of Effective Communication Scientific Evidence Base Review. Department of Health. The Scientific Pandemic Influenza Advisory Committee SPI Department of Health.2010.

[72] Petts J Horlick-Jones T.and Murdock, G. (2001). Social Amplification of Risk: The Media and The Public. Contract Research Report 329/2001. HSE Books, Sudbury.

[73] Vaughan E. and Tinker T(2009). Effective Health Risk Communication about Pandemic Influenza for Vulnerable Populations. American Journal of Public Health, 99 (2), 324-332.

[74] Rubin, G.J., Amlôt, R., Page, L., Wessely, S. (2009). Public Perceptions, Anxiety and Behavioural Change in Relation to the Swine Flu Outbreak: A Cross-Sectional Telephone Survey. British Medical Journal, 339, b2651

[75] Tang, C.S.K., and Wong, C.Y. (2005) Psycho-social Factors Influencing the Practice of Preventive Behaviours against the Severe Acute Respirator Syndrome among older Chinese in Hong Kong. Journal of Aging Health, 17, 490-506.

[76] Larson H, Cooper L, Eskol J, Katz S, Ratzan s. New Decade of Vaccines 5
Addressing the vaccine confidence gap Published Online June 9, 2011 DOI:10.1016/S0140- 6736(11)60678-8

between current levels of public confidence in vaccines and levels of trust needed to ensure adequate and sustained vaccine coverage"

Bults[77] et al addressing the issue of building trust recommend that health authorities regularly provide information on outbreaks, communicate certainties and uncertainties, and maintain transparent decision-making to instruct and motivate the public to take measures. They believe that this will help to build public trust in health authorities and prevent misconceptions. They also believe that risk communications should be tailored to regional, cultural, and societal conditions.

Larson et all advocate more research on individual determinants of public trust, and on what mix of factors are most likely to sustain public trust as they believe that there has been a lack of quality and rigor in much of the research which focuses on understanding the psychological, social and political factors that affect public trust in vaccines. According to Larson et al key trust issues related to the development of more effective communication and behavioural influencing strategy, include the need to address the following conclusions:

- Public concerns about vaccines are not merely about vaccine safety, but are also about vaccine policies and recommendations, vaccine costs, and new research findings.

- Public decision making related to vaccine acceptance is complex and is neither driven by scientific nor economic evidence alone, but is also driven by a mix of scientific, psychological, sociocultural, and political reasons, all of which need to be better understood.

- Although communication of positive, evidence-based information about the safety of specific vaccines and their benefit–risk ratios to the public is crucial, communication alone will not stop public distrust and dissent against vaccines.

- Levels of public trust in vaccines are highly variable and context specific. To sustain or restore confidence in vaccines, a thorough understanding is needed of the Population's—or subpopulation's—specific vaccine concerns, historical experiences, religious or political affiliation, and socioeconomic status.

- Core principles to be followed by all health providers, experts, health authorities, policy makers and politicians include: engagement with and listening to stakeholders, being transparent about decision making, and being honest and open about uncertainty and risks.

Larson et al also make the point that in a rapidly developing technological and information sharing rich world the internet and other new forms of social media and social networking have not only allowed for rapid and ubiquitous sharing of information—and misinformation—but have also allowed new methods of self-organisation and empowerment among online communities to develop rapidly. Some of these communities have and will continue to challenge the information and advice formulated by statutory and professional public health organisations.

[77] Bults M, Beaujean D, Richardus J H, Voeten H. Perceptions and behavioral responses of the general public during the 2009 Influenza A (H1N1) pandemic: a systematic review (In Press) 2012.

These new non-hierarchical, dialogue based communication systems are not unique to pandemic events, but part of a broader environment of increasing public questioning and the emergence of dissent groups, particularly in areas that include risks such as climate change and many areas of public health and information openness.

The internet, social media, mobile phone and smart phone networks have shifted the methods and speed of communication substantially. This new technology is enabling information about pandemics and immunisation to be gathered, analysed and commented on by far more people far faster. The amount of information available has increased greatly, including scientifically valid data and evidence-based recommendations alongside a lot of poor quality data, personal opinions, and misinformation put about by particular interest groups. The extent of the Internet's direct impact on people's health decision making [78] is still low, but rising. Especially the amount of interactive use of the Internet is increasing, e.g. due to the use of social media. It is argued that the fact that individuals do not report the Internet to be an important source of information does not necessarily mean that the information obtained in their Internet searches is not influential in their decisions.

A study 'e-health Trends in Europe' investigated who searches on the Internet for health-related information, how often and how. Two independent surveys, separated by an interval of 18 months, were conducted in 2005 and 2007 with representative samples (N=14,956) from seven European countries: Denmark, Germany, Greece, Latvia, Norway, Poland, and Portugal. The results revealed an increase in this time period from 42% to 52% of the population who surf the Internet for health information[79].

There is a tendency towards a more interactive use of information especially among 'digital natives' (i.e. those who grew up with the Internet). However, it is also striking that in comparison to other available information the Internet is perceived to have a very low importance for health decisions. However, the most important source of trusted information is health professionals, followed by conventional media. However, the fact that individuals report that they do not consider the Internet to be an important source does not necessarily mean that the information obtained in their frequent Internet searches does not influence their decisions.

In this section we have briefly reviewed the behavioural challenges posed by pandemic events. These challenges relate to the probable changing risk profile of an event, the need for multiple stakeholders including citizens to trust and be engaged in programmes designed to reduce risk and harm and from the multiple potential behaviours that authorities and communities are seeking to influence during a pandemic event. There is also a fundamental tension between communication programmes aimed at raising knowledge levels and attitudes and beliefs and programmes aimed at influencing behaviour. The next section reviews some of the limitations of programmes exclusively focused on information transmission.

Conclusions

A number of lessons can be drawn from the papers reviewed in this section. Co-ordination of international, national and local communication and marketing efforts in a planned and proactive way needs be established as an integral part of any preparedness programme.

[78] Betsch C. Innovations in communication: the Internet and the psychology of vaccination decisions. Euro Surveill. 2011;16(17):pii=19852. Available online: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19852

[79] Kummervold PE, Chronaki CE, Lausen B, Prokosch HU, Rasmussen J, Santana S, et al. e Health Trends in Europe 2005-2007: A Population-Based Survey. J Med Internet Res. 2008;10(4):e42.

Given the multiple behaviours and audiences a comprehensive strategy will also be required to build and sustain trust amongst the public. Communication consistency is also required and information needs to be delivered in a timely and on-going way to advise people of shifts in risks and new resulting recommendations. There is also a need for both a rationale set of suggested actions based on the best available science to be offered to accompany every communication explaining to people why they are being asked to change their behaviour. However, communication programmes also need to include recognition of non-rational decision making and influencing factors. These factors will also need to be taken into account in any programme designed to influence attitudes and behaviour given what is known about non rational choice, this issue is explored more fully in subsequent sections of this paper.

In developing any communication or behavioural programme a further challenge will be a need to not only translate but also to customise educational material and other approaches to influencing behaviour to reflect the social and cultural norms of given populations. Clearly material should be pre-tested prior to use to assess acceptability and impact. Given the range and complexity of the many stakeholders and potential community influencers, stakeholders and other appropriate community leaders and influencers including the media should be included in the planning, implementation and evaluation of programmes. The use of key opinion leaders and other influential people can also potentially assist communication efforts.

With regard to the selection of the best communication channels a key challenge is to identify both those channels that people use and trust but also those channels that are the most cost effective. As well as developing message and influencing strategies that people trust a further challenge will be to identify key barriers and competitive forces that exert counter views and influence to those expressed by governments and experts or that simply represent real economic, physical or time barriers that get in the way of recommend action. Action to reduce the impact of these counter forces, barriers and blocks will also need to be built into programme design. WHO recommend [80] four steps that should be put in place to further enhance communication and influence strategies. These four macro policy recommendations with regard to communication and behavioural influence represent a good checklist for those responsible for enhancing programme design and delivery.

1. It is advisable to create a framework for evaluating the effectiveness of the various measures and to make a greater effort to understand community issues.

2. To enhance the sustainability and impact of the measures, linking behavioural interventions to those used in other existing programmes and with other diseases is important. This linkage should be at country level and spread across all UN agencies.

3. There is a need for a communication framework and associated tools to be used at the national level along with implementation capacities suited to each level.

4. There is a general need to strengthen risk communication skills in key responding staff.

Given the key challenges associated with implementing and managing communication and behavioural influencing programmes set out in this section of the paper and the proceeding sections, the following proto tool sets out a checklist that those responsible for designing and managing effective programmes can use to check that all the major elements of what should constitute an effective approach are in place.

[80] Public health measures during the influenza. A(H1N1)2009 Pandemic. Meeting Report. WHO Technical Consultation. Gammarth, Tunisia 26 28 October 2010

Proto Tool 1

Adopting a Goals and SMART Objectives Approach to Specifying Specific Behavioural Targets in Pandemic Communication and Marketing Programmes.

This proto tool sets out an approach for establishing what specific behaviours will be the focus of an intervention programme or campaign. The term ‘behaviour change’ is widely used and while a useful short hand for discussions about ways to influence behaviour, it can constrict and does not adequately describe the range of issues that need to be considered. Often the target is not to ‘change’ a behaviour but to find ways to: encourage the adoption and establishment of helpful and positive behaviour; and or how to avoid the adoption and establishment of harmful or problematic behaviour. The approach set out in this proto tool starts by recognising that behaviour is inherently ‘dynamic’, i.e. behaviour is not a fixed state or static, but changes overtime. Behaviour is inherently ‘dynamic’ i.e. subject to variation and is often not an isolated single action, but part of a pattern of actions over time’

The approach set out in this proto tool starts with the development of a clear understanding of ‘what’ behaviour is occurring, and what different people know, think and feel about it. Before going on to analyse what theory or models that might help inform or develop insight into why people are adopting a behaviour and the potential insights that might provide ways for effectively intervening. A focus on specifying precisely target behaviours informs the development of a theoretical perspective rather than the other way round.

As stated above there can be a tendency with traditional ‘behaviour change’ approach to focus specifically on the ‘problem behaviour’ and what can be perceived as ‘problem people’, and to concentrate on trying to get them to change. A key consideration is to understand what range of factors are influencing both the positive and the problematic behaviours.

Establishing Behavioural Goals and SMART Objectives

The task is to be able to describe the issue being addressed in terms of specific behaviours both those behaviours that are problematic and those that are positive and need to be encouraged. This will help ensure that the methods or interventions used can be geared to addressing the specific behaviours with specific target groups. Behavioural goals are overarching aims or statements of intent, behavioural objectives are more specific and should ideally be able to be expressed in SMART form (SMART; Specific , Measurable, Achievable, Relevant, Time bound) and also expressed in terms of the focus of the objective: Cognitive, (Knowledge, and understanding) Affective (Emotional , beliefs and attitudes) or Psychomotor (Physical doing observable actions)

The following checklist sets out a number of issues that need to be considered for both positive behaviours and problematic behaviours

Defining Behaviour and Setting SMART Objectives Proto Tool

An AIM is:

A broad strategic purpose of a project, AIMS can be long term, medium term or short term.

An Objective is:

A specific, measurable goal, whose achievement will contribute towards the aim.

1. **Defining the problem:**

   Think of your health problem as the gap between what should occur in your community and what is occurring, or the gap between an acceptable/desirable health status and the current status.

   Problem definition statement:

2. **What is the aim of the intervention?**

3. **Objectives can be focused on three different issues:**

   - **Affective** objectives, focused on feelings.
   - **Cognitive** objectives, focused on learning.
   - **Psychomotor** objectives focused on doing or observable or reported behaviour.

4. **Objectives should be set out in a SMART format. SMART stands for:**

   - **S**pecific: not open to different interpretations.
   - **M**easurable:
   - **A**chievable: with the resources that are available.
   - **R**eliable: durable and consistent data can be gathered.

- **T**ime bound: can be measured within the time frame of the intervention.

5. **Objectives must be specific and answer the following questions:**

    - What you are evaluating?
    - What are you aiming to achieve?
    - How will change be measured?
    - Who is the intervention aimed at?
    - Where is it taking place?
    - What is its time scale?
    - Who will deliver the intervention?

E.g. The programme will increase the current attendance rate of 12% at the East Rd Vaccination Clinic by white middle class men aged 25-35 from the Small Town area, to a rate of 15% by the end of December 2013.

6. Behavioural Feasibility Assessment

Use the following check list of questions to assess the likelihood of the desired behaviour being adopted:

1. Is the current behaviour seen as a problem?
2. How rewarding is the undesirable behaviour?
3. How costly is the current behaviour?
4. How complex is the behaviour (does it involve several elements)?
5. How frequently must the desired behaviour be performed?
6. How compatible is the desired behaviour with the target audience's behaviour?
7. Is the current behaviour approved of socially?
8. Are their major barriers to engaging with the desired behaviour?
9. What information does the audience need to perform the behaviour?
10. What skill does the audience need to perform the behaviour?
11. What resources does the audience need to perform the behaviour?
12. Are there some members of the segment who already do the desired behaviour?

7. List the potential target audiences

- **Primary audience** (The key people you want to help change)
- **Secondary audience** (The people who you can help and who can help the primary audience)
- **Tertiary or other audiences** (Others who have influence on the primary and or secondary audiences)

Primary **Secondary** **Tertiary**

8. Current Behaviour

Describe current problematic behaviour (Set out in specific and quantifiable terms the behaviour)

List and describe related problematic behaviours.

List and describe current beneficial behaviours to be maintained.

Specify the behavioural goals for each target group? Specify positive behaviours to be maintained, negative behaviours to be changed and new behaviours to be adopted.

Positive behaviours to be maintained:

Cognitive

Affective

Psychomotor

Negative behaviours to be changed

Cognitive

Affective

Psychomotor

New behaviours to be adopted:

Cognitive

Affective

Psychomotor

Under each behaviour set out the specific behavioural objectives that relate to that goal, (There may be several) for positive, negative and new behaviours. Specify how each behavioural objective can be expressed as a single specific observable behaviour and how it could be measured. Each behavioural objective should be expressed in terms of a SMART objective.

Positive behaviour objectives:

	Cognitive	Affective	Psychomotor
1			
2			
3			
4			

Negative behaviour objectives:

	Cognitive	Affective	Psychomotor
1			
2			
3			
4			
Etc:			

New behaviour objectives:

	Cognitive	Affective	Psychomotor
1			
2			
3			
4			
Etc:			

"European policy-makers and politicians are put in a hard place by the prospect of modern influenza pandemics. They don't know when one is going to happen, where it will start or what it will be like"[81]

Limitations and Strengths of Communication Dominated Approaches to Influencing Behaviour

Traditional assumptions around communication and how people respond to information have in the past shaped much of the pandemic communication policy design and implementation. There has been and continues to be a great deal of effort and guidance focusing on crafting messages and ensuring that they are tailored to the different stages of a pandemic event [82] [83] [84] [85] or message based strategies focused on particular challenges such as understanding and use of vaccines[86] [87] . This situation is now changing and more effort is being put into widening the scope of informational campaigns as components of behaviour change programmes WHO/UNICEF [88] and additional guidance also exists about how to engage stakeholders and citizens in a more community focused approach to dealing with outbreaks[89].

However, in many countries and services the dominant focus continues to be on creating clear messages and consistent communication strategies. The scope of these communication efforts span a variety of audiences including the public, professional and community members. Communications programmes are often seen to be supportive to other elements of the pandemic response. Using a communications dominated strategy for increasing awareness and knowledge transmission based on the belief that people will carry out recommended behaviours having acquired accurate knowledge and assessed risk is

[81] Nicoll A, Sprenger M . Learning lessons f rom the 2009 pandemic: putting infections in their proper place. Eur J Epidemiol (2011) 26:191–194 DOI 10.1007/s10654-011-9575-

[82] Pan American Health Organization. '*Risk Communication and Social Mobilization in Support of Vaccination Against Pandemic Influenza in the Americas'* 2009

[83] WHO. *'Guidelines for Developing Behavioural Change Interventions in the Context of Avian Influenza'*. 2006.

[84] AED. *'Social Mobilization and Behaviour Change Communication for Pandemic Influenza Response: Planning Guidance.'* 2009.

[85] WHO. '*Communications for Pandemic Influenza Response'.* 2009.

[86] WHO/H1N1 Communications Team. *'Integrated Communication" Strategy for Distribution of H1N1 Vaccine'.* Feb 2010.

[87] DH. Bish, A. Michie, S. Yardley, L. '*Factors Associated with Uptake of Vaccination Against Pandemic Influenza'.* 2011.

[88] '*Behavioural Interventions for Reducing The transmission and Impact of Influenza A (H1N1) Virus: A Framework for Communication Strategies'.* 2009.

[89] AI.COMM Project. *'Bringing the Community Together to Plan for Disease Outbreaks and Other Emergencies'.* 2012.

however, increasingly being augmented by a deeper understanding about how people are influenced, how they consume, share and generate information and understanding.[90] [91] It is now widely accepted that behaviour is influenced by many other factors and other clear information that triggers logical decision making based on accurate assessments of risk. This issue will be expanded in sections six and seven of this paper.

There is however, a danger that some countries and public health authorities have relied too heavily on a purely informational campaign and awareness approach. The risk is that by focussing on only one approach we do not consider the full range of possible levers available to persuade the public, inform them and trigger required behaviours.

To fully understand how to influence behaviour, it is essential that we take a cross-disciplinary approach, using insights from a number of approaches to fully understand all the factors that influence people's behaviour, this issue is dealt with in later sections of this paper. See Annexe A that represents a sweep of this broad field of literature.

Regardless of the relevant contribution and priority placed on information efforts it is clear that in any scenario information and communicating with the public, professional and other influencers will have a key role to play and must be an integral part of any fully developed response. Therefore the purpose of this section of the paper is to draw together understanding and insights about the role of informational approaches and contributions to pandemic management prevention and care. This sector also introduces the first set of 'Proto Tools' focused on information use, to assist those responsible for planning and delivering information programmes.

The evidence of effectiveness for health promotion interventions and behavioural interventions face two key challenges. The first is the methodological challenge of designing quality studies that can prove cause and effect and control for extraneous variables. The second challenge is sustaining an intervention of sufficient duration and weight to create a population level effect in terms of not just knowledge gain or attitudinal change but also measurable behavioural and physiological change.

According to ECDC[92] public health evidence for the effectiveness of interventions is generally weak. For example Thacker et al [93] reviewed the evidence for the effectiveness of interventions to modify 194 potentially modifiable risk factors for 31 conditions of high priority for ECDC. Of the 702 population based interventions evidence for the preventable factors were found for only 4.4% In a recent ECDC technical report[94] an assessment was made of the type and strength of evidence for each of the 27 interventions reviewed. The grading of the evidence found that only 2 of the 27 vaccine studies reviewed were graded at A (Systematic review primary data and RCT) and 13 were graded at C (Case study reports and observational studies of poor quality)

Within the body of the report ECDC set out the essential processes for assessing the quality of the evidence at each of these stages of risk assessment and intervention consideration.

[90] Noar S A ten year retrospective of research in health Mass Medis Campaigns; Where do we go from here?. Journal of Communication, 11:21 – 42. 2006

[91] Bertrand J . Systematic review of the the effectivness of mass communication programs to change HIV / AIDS related behaviours in devloping countries. Health Education Research Theory and Practce. Vol 21 No 4 567-597. 2006

[92] European Centre for Disease Prevention and Control. Technical report; Evidence based methodologies for public health. How to access the best available evidence when time is limited and there is a lack of sound evidence. Stockholm. ECDC. 2011.

[93] Thacker S, Ikeda R, Gieseker K, Mendelsohn A , Sayda S, Crry C. The evidence base for public health informing policy at the Centres for Disease Control and prevention. American Journal of Preventive Medicine. 2005. Oct ; 29.: 227 -33.

[94] European Centre for Disease Prevention and Control. Guide to public health measures to reduce the impact of influenza pandemics in Europe. The ECDC Menu. Stockholm. ECDC.2009

The report also sets out in the form of the AGREEII instrument (Appraisal of Guidance for research and evaluation) which is an international collaboration to assess public health guideline quality defined as 'confidence that the potential biases of guideline development have been addressed adequately and that the recommendations are both internally valid and are feasible for practice'. The AGREEII instrument sets out within its six domains suggested criteria for assessing the quality of guidance developed. In relation to the application of the AGREEII instrument in the field of communicable disease the report suggests that there are likely to be additional factors that need to be considered. A set of specific criteria for communicable disease guidance development are set out as:

- Communication the recommendations to patients, public and media.
- Consideration of delivery structures and mechanisms.
- Consideration of legal and regulatory frameworks.
- Role of ethics.
- Health economics.
- Trade-off between harms and benefits.

The AGREEII instrument is helpful in that it highlights the need to consider in a consistent way communication and behaviour change elements of communicable disease guidance development and communication. The guide lines specifically mention the need to consider diversity issues and issues of discrimination and the need to both assess and communicate potential costs of interventions and negative effects of programmes.

The Role of Information in Supporting Pandemic Preparedness

As discussed in the proceeding section information and education are key elements in managing pandemic events and an integral part of the public health tool kit. Information programmes aimed at small groups, individuals and the whole population via the mass media and digital media all have a role to play.

Drawing on more generic work by Miller & Ware [95] the following check list suggests the range of contributions that informational programmes may contribute to public health interventions:

1. Information programmes can stimulate learning and generate changes in understanding, beliefs attitudes and behaviour.

2. Information can influence the general public conversation. The 'agenda setting' role of information is potentially one of its most powerful and sustained impacts. Through sustained repetition informational programmes can produce long-term benefits by creating a climate of opinion, setting and or influencing the agenda for public discussion.

[95] Miller, M. & Ware, J. 1989, *Mass media alcohol and drug campaigns; consideration of relevant issues,* Monograph Series No. 9, AGPS, Canberra

3. Informational programmes can assist with reinforcing positive existing beliefs, opinions and behaviours, it can also help clarify issues and clear up misunderstanding.

4. Mass media and digital information programmes can produce multiplier effects when combined with interpersonal communication efforts.

5. Community development and engagement programmes and stakeholder management programmes can be enhanced through rigorously developed and executed informational programmes.

6. Information programmes as integrated components of public health programmes can make a significant contribution to behavioural change strategies as well as the achievement of information, attitude and knowledge programme goals.

The potential contributions of informational programmes are however, often reduced by a series of factors and approaches to the planning and delivery of programmes. Many health information campaigns exhibit some or all of the following characteristics which have the potential to reduce their impact:

- Some campaigns are still constructed by experts with limited input from communities and stakeholders. This approach which is often driven by "experts" often does not undertake sufficient insight research into the attitudes, beliefs and behaviours of target groups with the result that the messages are often misunderstood or viewed as irrelevant by the people they are intended for. This approach often results in recipients filtering out messages, dismissing them or in extreme cases reacting in an opposite way to what is being recommended. .

- Many programmes are not sustained at a level of intensity of over long enough periods to gain audience awareness and acceptance. Timescales are often short-term with little baseline evidence for action and evaluation of the impact.

- Some campaigns are not adequately performance or programme managed. Much activity is focused around developing messages and selecting audience channels with the result that vital planning, insight and evaluation stages are neglected.

- There is a tendency to repeat public health information to the public in the same format/style instead of developing and refreshing the message over time so that it changes to meet the expectations/needs of target groups. The result is that people are bored and the information is largely ignored.

- Campaigns and other forms of information can be poorly co-ordinated so that contradictory messages or differences in interpretation of advice are picked up by the general media, this can add to confusion and charges that authorities are being inconsistent in the advice they provide.

- Some campaigns have either insufficiently specific objectives or have over ambitious objectives given the resource level available. Often programmes are insufficiently funded to achieve their goals.

- Many campaigns fail to utilise a full intervention mix of education, design, support services and control measures in a co-ordinated and sustained way with informational programmes.

In addition to these common planning and execution failings it is well established that in most circumstances the providing information, on its own often has limited impact on people's health behaviour[9697]. This is because health behaviour is, as stated previously a complex issue that is determined by more than just an individual's level of knowledge.

In most cases the simple one way persuasive model of information influences has now been replaced by a more socially oriented approach, in which mass and digital media are viewed as one of many possible sources of information in society. Media sources cannot be discussed in isolation from personal information sources – families, friends and so on – which may support or contradict state sponsored communication. It is also clear that the impact of informational messages can no longer be determined by content alone. Members of the intended target audience are now regarded by many people responsible for crafting public informational programmes as active participants in the communication process. This means that existing beliefs, attitudes, experiences, trust and knowledge all affect interpretation and acceptance or rejection of messages.

The Evidence Base

With regard to generic evidence about the utility of informational and mass media campaigns the National Institute for Health and Clinical Excellence (NICE) has produced a number of guidance documents covering issues such as obesity [98], smoking (preventing children and young people taking up smoking[99], physical activity [100], and programmes for attitude and behaviour change [101]. In general terms the NICE reviews indicate that there is some good evidence that information campaigns, coupled with other measures can have a significant impact. Nice also found however, that many of the studies were of variable quality. Although some interventions have been fully evaluated many have not been, some evaluations were

[96] Robertson R (2008) Using Information to Promote Healthy Behaviours. London: The King's Fund. Available at: www.kingsfund.org.uk/publications/other work by our staff/ using_information.html (accessed on 8 July 2008).
[97] Coulter A, Ellins J (2007). 'Effectiveness of Strategies for Informing, Educating and Involving Patients'. *British Medical Journal*, vol 335, no 7609, pp 24
[98] NICE (2006). *Obesity: Guidance on the Prevention, Identification, Assessment and Management of Overweight and Obesity in Adults and Children*. NICE Clinical Guidance 43. London: NICE. Available at www.nice.org.uk/nicemedia/pdf/CG43NICEGuideline.pdf.
[99] NICE (2008a). *Mass-Media and Point-of-Sales Measures to Prevent the Uptake of Smoking by Children and Young People*. NICE public health guidance 14. London: NICE. Available
[100] Interventions that use the Environment to Encourage Physical Activity *Evidence review. NICE. 2006 at: http://www.nice.org.uk/nicemedia/pdf/Physical_activity_Evidence_Review_FINAL.pdf*
[101] NICE (2007). *Behaviour Change at Population, Community and Individual Levels.* London: NICE. Available at: www.nice.org.uk/nicemedia/pdf/PH006guidance.pdf (accessed on 3 November 2008).

lacking in quality, so the results are not sufficiently robust to be included in reviews or used to inform guidance from NICE.

This makes it difficult to assess whether the observed impacts are attributable to the intervention or to other factors in the wider surrounding environment. A lot of the studies also originate in America so the findings and recommendations may not be transferable to a European setting. Also many of the studies included mainly process focused outcome measures such as the number of phone calls to a 'quit smoking' line, rather than 'harder' behavioural outcome measures such as the number of smokers who were still not smoking after a defined time period. Many evaluations also measured short-term impacts only, and did not consider whether behaviour change was sustained once the intervention or incentive finished. See annex A for further analysis of characteristics of effective programmes.

Notwithstanding these study limitations according to the Kings Funds[102] there is reasonable evidence that:
"*information campaigns can encourage people to change their smoking, diet and exercise habits, though providing information seems to have more impact in changing knowledge and beliefs, than behaviour. However, media campaigns are most effective when they run alongside other interventions"*[103] [104].

With regard to the promotion of vaccination the CDC Meta evidence and economic review system [105] has undertaken a number of systematic reviews that include specific reviews of informational and educational interventions. One programme focuses on targeted vaccination programmes[106]. Under this programme a specific review was undertaken to assess the utility of a community wide education programme approach[107] . The findings of the task force were that there is:

"insufficient evidence to determine the effectiveness of using community-wide education when implemented alone in improving influenza, pneumococcal polysaccharide, or hepatitis B vaccination coverage in high-risk adults because no studies qualified for review".

The review series also found insufficient evidence to endorse expanded access in healthcare settings[108], using client or family incentives when implemented alone in improving influenza, pneumococcal polysaccharide, or hepatitis B vaccination coverage in high-risk adults[109] and provider education when used alone[110]. However, the reviews did find that using a combination of interventions including community wide and targeted information approaches is supported by available evidence[111].

Lessons can also be drawn from interventions reviewed that focus on both universally available vaccines [112] and health communication reviews. With regard to universally targeted vaccines the following forms of intervention were recommend:

[102] Commissioning and behaviour change. The King's Fund London .2008
[103] Flynn BS, Wordon JK, Secker-Walker RH, Badger GJ, Geller BM, Costanza MC (1992). 'Prevention of Cigarette Smoking through Mass Media Intervention and School Programmes'. *American Journal of Public Health*, vol 82, no 6, pp 827–34
[104] Tones K, Tilford S, Robinson Y (1990). Health Education: Effectiveness and efficiency. London: Chapman and Hall.
[105] The Guide to Community Preventive Services. The Community Guide. What works to Promote Health Available at: http://www.thecommunityguide.org/index.html
[106] http://www.thecommunityguide.org/vaccines/targeted/index.html

[107] http://www.thecommunityguide.org/vaccines/targeted/communityeducation.html
[108] http://www.thecommunityguide.org/vaccines/targeted/healthcaresettings.html
[109] http://www.thecommunityguide.org/vaccines/targeted/clientincentives.html
[110] http://www.thecommunityguide.org/vaccines/targeted/providereducation.html
[111] http://www.thecommunityguide.org/vaccines/targeted/multi_combination.html
[112] http://www.thecommunityguide.org/vaccines/universally/index.html

Home visits to increase vaccination rates[113], reducing costs[114]. Increasing access in schools and community settings, [115] establishing financial incentive schemes, [116] client reminder systems[117] as well as both health care and community based systems in combination [118] [119]such as:

- Client reminder and recall systems.
- The use of staff to conduct manual outreach and tracking of clients.
- Mass and small media.
- Educational activities.
- Expanded access to vaccination services.

However, CDC do not recommend community-wide education interventions when used alone where the community-wide education provides information to most or all of a target population in a geographic area and information is disseminated with the goal of informing, encouraging, and motivating individuals to seek recommended vaccination using methods such as: person-to-person interactions, community mobilization and mass or small media [120].

CDC also found that there was insufficient evidence for clinic based education alone [121] provider based education alone[122]. CDC does however recommend an approach that uses multiple interventions in combination [123] such as:

- An intervention to enhance access to vaccination services (expanded access in healthcare settings, reduced client out-of-pocket costs)
- At least one provider- or system-based intervention (standing orders, provider reminder systems, provider assessment and feedback), and/or
- At least one intervention to increase client demand for vaccination (client reminders, client education)

With regard to generic health communications [124] based on the strength of current evidence CDC recommends[125] the use of mass media and targeted communication programmes in the fields of:

[113] http://www.thecommunityguide.org/vaccines/universally/homevisits.htm

[114] http://www.thecommunityguide.org/vaccines/universally/clientoutofpocketcosts.html

[115] http://www.thecommunityguide.org/vaccines/universally/schools_childcare.htm

[116] http://www.thecommunityguide.org/vaccines/universally/IncentiveRewards.html

[117] http://www.thecommunityguide.org/vaccines/universally/clientreminder.html

[118] http://www.thecommunityguide.org/vaccines/universally/healthsysteminterventions.html

[119] http://www.thecommunityguide.org/vaccines/universally/communityinterventions.html

[120] http://www.thecommunityguide.org/vaccines/universally/communitywideeducation.html

[121] http://www.thecommunityguide.org/vaccines/universally/clinicbasededucation.html
[122] http://www.thecommunityguide.org/vaccines/universally/providereducation.html
[123] http://www.thecommunityguide.org/vaccines/universally/healthsysteminterventions.html
[124] http://www.thecommunityguide.org/healthcommunication/index.html
[125] http://www.thecommunityguide.org/healthcommunication/index.html

- Use of Child Safety Seats: Community wide Information and Enhanced Enforcement Campaigns.
- Community-Wide Campaigns to Promote the Use of Folic Acid Supplements.
- Promoting Physical Activity. Campaigns.
- Vaccinations to Prevent Diseases, Universally Recommended Vaccinations, Community Based Interventions Implemented in Combination.
- Reducing Alcohol-Impaired Driving: Mass Media Campaigns.
- Client-Oriented Screening Interventions: One-on-One Education.
- Use of Child Safety Seats: Distribution and Education Programmes.
- Children and Youth School-Based Programs to Reduce Violence.

CDC found insufficient evidence however, to recommend information based action in the following areas:

- Preventing Skin Cancer: Mass Media Campaigns.
- Provider-Oriented Interventions: Provider Education.
- Promoting Physical Activity Campaigns and Informational Approaches: Classroom-Based Health Education Focused on Providing Information.
- Universally Recommended Vaccinations: Provider Education When Used Alone.
- Obesity Prevention & Control Mass Media Interventions to Reduce Screen Time.
- Promoting Physical Activity Campaigns and Informational Approaches: Mass Media Campaigns.
- Increasing Tobacco Use Cessation: Mass Media—Cessation Series.
- Preventing Skin Cancer: Community-wide Multi-component Interventions.

Further evidence exists that reinforces the conclusions for the CDC reviews about the place and utility of informational and educational approaches as part of public health programmes [126] [127] [128] [129].

There is then a reasonable weight of evidence that under specific conditions well planned, targeted, well-executed health information campaigns can make a contribution to more comprehensive programmes but appear to have much less effect when delivered as a stand-alone response. If used in a co-ordinated and comprehensive way campaigns can have an impact on health knowledge, beliefs, attitudes, and behaviours[130].

The scale and effective size of interventions is also a clear issue that needs to be considered. Whilst effective size may appear modest compared with the impact of some clinical interventions on individual patients, these campaign effects can translate into major public health impact given the wide reach of mass media. Such impact can only be achieved, however, if principles of effective campaign design are carefully followed. Snyder

[126] Grol R, Grimshaw J (2003). 'From best evidence to best practice: effective implementation of change in patients' care'. The Lancet, vol 362, no 9391, pp 1225–30.

[127] Tones K, Tilford S, Robinson Y (1990). Health Education: Effectiveness and efficiency. London: Chapman and Hall

[128] Rogers, E.M. & Storey, J.D. 1987, 'Communication campaigns', in Berget, C.R. & Chattee, S.H. (eds), *Handbook of Communication Science*, Sage Publications, San Francisco.

[129] Elliot, B. 1988, 'The Development and Assessment of Successful Campaigns' Education Co-ordinators' workshop on Media Skills, Brisbane.

[130] Lancaster T, Stead L (2005) 'Self-help Interventions f or Smoking Cessation'. *Cochrane Database Systems Review,* Vol 3.

et al [131] Meta analysis of campaigns demonstrated that campaigns have been shown to have small measurable effects in the short-term. Campaign effect sizes vary by the type of behaviour: r=.15 for seat belt use, r=.13 for oral health, r=.09 for alcohol use reduction, r=.05 for heart disease prevention, r=.05 for smoking, r=.04 for mammography and cervical cancer screening, and r=.04 for sexual behaviours. However, campaigns with an additional enforcement (regulatory) component were shown to be more effective than those without. The "average" campaign affected the intervention community by about five percentage points, and nutrition campaigns for fruit and vegetable consumption, fat intake, and breastfeeding, have been slightly more successful on average than for other health issues. There is also evidence of a dose-response relationship between campaign weight (dose) and impact (behaviour change); higher levels of exposure tend to lead to bigger changes in people's way of thinking and behaving [132] [133] [134] [135] [136] .

A Cochrane Systematic review[137] assessing the effects of mass media on the utilisation of health services also concluded that there is evidence that these strategies may have an important role in influencing the use of health care interventions; they should be considered as one of the tools that may encourage the use of services. A review focussing on physical activity[138] campaigns concluded that they should focus more on influencing short term features such as social norms, to bring about long-term behaviour change.

Individual Approaches to Information Transmission

As well as mass media approaches to information transmission it is also clearly possible to design and deliver interventions that are focused on small groups and individuals.
Going beyond segmented approaches to mass media promotions into the field of personalised information provision is something that is being enabled on a more cost effective basis by digital communication channels. Tailoring information to individuals can also increase the impact of campaigns.

Tailoring involves collecting relevant information from individuals, then using this information to design the most effective message or intervention approach [139] for that type of person.

[131] Snyder, L. B., Hamilton, M. A., Mitchell, E. W., Kiwanuka-Tondo, J., Fleming-Milici, F., Proctor, D. 2004. A meta-analysis of the effect of mediated health communication campaigns on behavior change in the United States. J Health Communication

[132] Hyland A. M. Wakefield, M. Higbee C. Szczypka G., Cummings, K. M. 2006 Anti-tobacco Television Advertising and Indicators of Smoking cessation in Adults: a Cohort Study. Health Educ Res

[133] Craig C. L. Cragg S. E Tudor-Locke, C. Bauman, A. 2006 Proximal impact of Canada on the Move: the Relationship of Campaign Awareness to Pedometer Ownership and Use. Can J Public Health.

[134] Schade, C. P., McCombs, M. 2005. Do Mass Media affect Medicare Beneficiaries' use of Diabetes Services? Am J Prev Med.

[135] Jorm, A. F., Christensen, H., Griffiths, K. M. 2005 The Impact of Beyond Blue: the National Depression Initiative on the Australian Public's Recognition of Depression and Beliefs about Treatments. Aust N Z J Psychiatry

[136] MMWR Effect of ending an anti tobacco youth campaign on adolescent susceptibility to cigarette smoking--Minnesota, 2002-2003. 2004.MMWR Morb Mortal Wkly Rep

[137] Grilli R, R. C. M. S. 2002 Mass media interventions: effects on health services utilisation. Cochrane Database of Systematic .Reviews: Reviews 2002 Issue 1.

[138] Cavill, N., Bauman, A. 2004.Changing the way people think about health-enhancing physical activity: do mass media campaigns have a role? J Sports Sci.

[139] Stretcher VJ, Velicer WF (2003) 'Tailoring smoking cessation programs to the specific needs and interests of the patient'. *British Medical Journal,* vol 327, pp E57–8.

Personal tailoring of information is a relatively new method, and therefore the evidence base is limited, however, a study of smokers in England found that tailored materials were useful in motivating those who did not want to quit or did not *think* they wanted to[140].

The Cochrane review of self-help interventions for smoking cessation also found 'some evidence for the effectiveness of tailored materials,'[141] Interventions designed to increase an individual's understanding; motivation and confidence come in many forms. Examples of interventions based on individual support include: [142]

- Goal setting and action planning.
- Group support programmes.
- Buddy schemes.
- Coaching and counselling.
- Relaxation techniques.
- Stress management.
- Skills training.
- Motivational interviewing.
- Maintenance strategies to prevent relapse.
- Structured problem solving and cognitive rehearsal.
- Coping strategies.

In the field of smoking cessation for example [143] it has been shown that a range of individualised solutions when combined delivered increased quit rates and attempts. A review by the Cochrane Collaboration supported these findings, stating that both individual counselling and group therapy increased people's chances of quitting [144]. This type of support is now widely used in many public health programmes.

As stated above, digital media is enabling mass personalisation and tailored support on a mass scale to be offered. This form of intervention is often labelled 'Mass Personalisation". Examples include the NHS LifeCheck,[145] system which provides personalised information and practical advice based on answers given in a health assessment questionnaire. Personalised support can also be delivered by a range of professionals or indeed by trained lay workers face to face or via the use of telephone-services. NHS direct is an example of this kind of personalised information service[146]. A further development of this kind of personalised information and support service is called 'Health Coaching' which is discussed further in section seven of this paper as it often goes beyond information into the arena of personalised behavioural change planning.

[140] Gilbert H, Nazareth I, Sutton S, Morris R, Godfrey C (2008). 'Effectiveness of computer tailored smoking cessation advice primary care (ESCAPE): a randomised trial'. *Trials,* vol 9, no 23. Available at: http://eprints.whiterose.ac.uk/4054/ (accessed on 8 July 2008).
[141] Lancaster T, Stead L (2005) 'Self-help interventions for smoking cessation'. *Cochrane Database Systems Review,* vol 3.
[142] Dixon A (2008). Motivation and Confidence: What does it take to change behaviour? London: The King's Fund. Available at: www.kingsfund.org.uk/publications (accessed on 8 July 2008).
[143] Naidoo B, Warm D, Quigley R, Taylor L (2004). Smoking and Public Health: A review of reviews of interventions to increase smoking cessation, reduce smoking initiation and prevent further uptake of smoking. London: Health Development Agency.
[144] Lancaster T, Stead L, Silagy C, Sowden A (2000). 'Effectiveness of interventions to help People Stop Smoking: findings from the Cochrane Library'. British Medical Journal, Vol 321, no 7257, pp 355–358
[145] http://www.nhs.uk/tools/pages/toolslibrary.aspx
[146] http://www.nhsdirect.nhs.uk/

New Media

This section of the paper is not intended to be a comprehensive review of the application of new media in the field of pandemic communication and behavioural influence, rather it sets out some of the emerging findings and possibilities offered by this interactive and distributed form of communication and influence. The new media revolution which is characterised by a more democratic control of information channels and a blurring between what is conceived to be expert and non-expert opinion together with a blurring of production and consumption of information and entertainment, has fundamentally changed the communication and influencing environment in which those responsible for pandemic communication operate.

This development driven by more connected communities and easy access to content production and viral spread of information has shifted fundamentally the process from top-down, one way expert-to-citizen (vertical) communication system to a less hierarchical, and more interactive(horizontal) communication system. Given the new technology and increasing to the point of almost universal access citizens and small groups of like minded advocates are increasingly questioning recommendations of experts and public institutions on the basis of their own, often web informed views. This situation is clearly not an issue limited to public health but one that reaches into all aspects of civic life and one that is changing the relationship between the state, figures of authority, experts and the general population. The technology and its instantaneous nature which allows interactive exchange between many users and the coming together of mobile and always connected services have shifted the methods and speed of communication substantially, allowing information about public health issues including pandemic events to be gathered, analysed, and commented on at such a pace that traditional approaches to media management and briefing during pandemic events can easily be left behind or left struggling to react to a rapidly evolving communication and opinion forming in this new democratised media environment.

Traditional print and broadcast media are however, still important and in many cases the most important sources of information news and public agenda setting. This fact together with the increasing integration between traditional and new media channels hosted by large media service providers and corporations means that there is still a great deal of scope and in many ways an even more effective and targeted way to use information approaches to influence opinion and public behaviour. This clearly means that those responsible for media and communication programmes in the public health field need to develop strategies that take account of new media opportunities in the fields of opinion setting, information distribution and market research.

The field of E-health" (An element of new communication technologies) is growing rapidly and represents the use of emerging information and communication technology to improve or enable health and health care. The term refers to the field at the intersection between medical informatics, public health, and business[147]. E-health connects clinical and non-clinical sectors, and includes both individual and population health-oriented tools [148] E-health

[147] Eysenbach G. What is e-health? Journal of Medical Internet Research 3(2):e20, 2001. URL: http://www.jmir.org/20012/e20
[148] Eng TR. The eHealth Landscape: A Terrain Map of Emerging Information and Communication Technologies in Health and Health Care. The Robert Woods Johnson Foundation, 2001. URL: http://www.informatics-review.com/thoughts/rwjf.html .

communication strategies include, but are not limited to: health information via the Internet, online support groups, online collaborative communities, information tailored by computer technologies, educational computer games, computer-controlled in-home telephone counselling, and patient-provider e-mail contact [149] Alongside E health the use of new media channels have the additional advantage of enabling communication that can be continued rather than limited to set times and the ability to integrate multiple communication modes and formats (e.g. audio, video, text, graphics). New media also has the ability to track, preserve, and analyse communications and responses to them in real time and analyse trends. The growth in research tools that scan web based social forums and networks and can analyse public reaction and moods are also being increasingly used by the commercial sector. New media also has the advantage of having the ability to customize programmes to user specifications, and interactivity (e.g., increased capacity for feedback) [150]

Not all E-health interventions are Web-based. Computer applications have also allowed new uses of traditional health communications media, such as print and telephone. Tailored print communications (TPCs) and telephone-delivered interventions (TDIs) are two examples that have the potential for reaching linguistically and culturally diverse audiences. For example, interactive games also offer another vehicle for public health interventions via new media channels. For example Lieberman et al. designed a series of Nintendo video games to improve children's prevention and self-care behaviours for asthma, diabetes, smoking prevention, and other health topics [151] .The games were based on well-established theories of learning and behaviour change, such as Social Cognitive Theory. They reduced players' urgent care and emergency medical visits by as much as 77%. [152]

The use of new media in addition to the issues raised above also poses three further challenges to public health communicators and those concerned with influencing behaviour during and prior to pandemic events: The issue of non-universal access and the digital divide, the issue of disproportionate emphasis being given to minority and non-scientifically justifiable opinion and the lack of robust evidence for the utility of new media interventions.

With regard to access issues opportunities are increasing for people to gain free access to the Internet via publicly provided access points in such areas as libraries and kiosks [153] , however, there are still large groups of often poorer and more vulnerable people who do not have access in many parts of Europe. The additional access issue related to the fact that despite the rapid growth of video and sound content the Internet is still a text-based and driven medium. The issue of literacy as well as health literacy is clearly a key barrier to accessing Web-based information or participating in online communities. There is a danger that new computer technologies could worsen existing inequities in health status for diverse

[149] Neuhauser L, Kreps G. Rethinking Communication in the E-health Era. Journal of Health Psychology 8(1): 7–22, 2003
[150] Science Panel on Interactive Communication and Health. Wired for Health and Well-Being: The Emergence of Interactive Health Communications. U.S. Department of Health and Human Services, U.S. Government Printing Office. Washington, D.C.: April 1999. URL: http://www.health.gov/scipich/pubs/finalreport.htm
[151] Lieberman, D.A. Interactive video games for health promotion: Effects on knowledge, self-efficacy, social support, and health. R.L. Street, W.R. Gold, & T. Manning (Eds.), Health promotion and interactive technology: Theoretical applications and future directions. Mahwah, NJ: Lawrence Erlbaum Associates, pp. 103–120, 1997.
[152] Lieberman DA. Management of chronic paediatric diseases with interactive health games: Theory and research findings. Journal of Ambulatory Care Management 24(1):26–38, 2001.
[153] U.S. Department of Commerce. A Nation On-line: How Americans are Expanding their Use of the Internet. Economics and Statistics Administration, National Telecommunications and Information Administration. February 2002. URL: http://www.ntia.doc.gov/ntiahome/dn/anationonline2.pdf.

populations. In the development of any strategy it will be important to involve community members in addressing issues of access and contribution possibly through interventions such as the provision of access points and training to support usage.

A further challenge represented by new media is the on-going journalistic imperative which is often enshrined in public communication services charters to present a 'balanced view of issues' Traditional and new media attempts to 'balance coverage' by the provision of equal opportunity to all viewpoints can lead to what appears to be legitimate challenges to public health experts advice especially when the views of extremist groups or well known individuals are given media time to express an alternative or negative view. For example, the views of celebrities such as Jim Carrey or Jenny McCarthy who have encouraged parents to question vaccines, have been shown to have an impact on the uptake of vaccines [154] The emergence of social media tools, such as Facebook with more than 955 million monthly active users and with 543 million monthly active users who used Facebook via mobile products as of June 2012 [155] has also helped create new methods of self-organisation and empowerment of virtual communities both locally and globally that argue against or sometimes campaign for the wide spread use of vaccines [156] [157] [158].The consequence of the new media environment is a mix of highly varied and often conflicting information being distributed and shared. This can lead to uncertainty and scepticism among citizens.

Finally, like many of the other approaches to communication and behavioural influence reviewed in this paper new media interventions in the field of public health suffer from a lack of robust evidence from intervention trials. Though research has demonstrated the effectiveness of some new communications technologies, further inquiry is needed into the mechanisms' underlying success. [159]

Conclusion

A clear message that comes across from this section of the paper is that there appears to be a strong case for using a range of approaches to increase understanding and awareness about pandemic events. What is equally clear is that information interventions of themselves have been found to be less effective than when they are executed as part of a more comprehensive programme. Many of the examples and reviews in this section of the paper indicate that health information approaches work best as part of a range of interventions to change people's awareness and ultimately behaviour. On their own informational programmes appear to have a modest contribution to make.

There appears however, to be less certainty about the exact amount of effort that should be put into informational based approaches in comparison with other forms of behavioural influence such as design solutions and the provision of incentives or disincentives. The relative mixed quality and patchy coverage of the evidence deemed sufficiently robust to give definitive guidance in many areas is also evident. However, the work of NICE, CDC,

[154] Jenny Mccarthy joins the defence of Andrew Wakefield. http://www. liquida.com/article/15670682/andrew-wakefield-autism-jennymccarthy (accessed March 30, 2011).
[155] Facebook. Press room. http://www.facebook.com/press/info.statistics (Accessed September 14, 2012).
[156] Kirby D. Evidence of harm mercury in vaccines and the autism epidemic: a medical controversy. New York: St Martin's Press, 2005.
[157] Mudur G. Anti-vaccine lobby resists introduction of Hib vaccine in India. *BMJ* 2010; **340:** c3508
[158] Peters RG, Covello VT, McCallum DB. The determinants of trust and credibility in environmental risk communication: an empirical study. *Risk Anal* 1997; **17:** 43–54.
[159] Kreps GL. Evaluating new health information technologies: expanding the frontiers of health care delivery and health promotion. Stud Health Technol Inform 80:205–12, 2002.

McGuire, Solomon and the other author's quoted in this paper along with contributions from other research suggest a number of practical proposals for designing successful informational campaigns as part of broader behaviour influencing strategies.

A number of researchers, both in health promotion and health communication fields have attempted to identify the conditions under which information is most effective in promoting health. A detailed analysis of the components of successful and unsuccessful campaigns by McGuire [160] concluded that campaigns that are carefully developed using formative research (both qualitative and quantitative), pay attention to the specific goals of the intervention, target populations, select appropriate channels and develop relevant message content should have a better chance to demonstrate impact. There is also evidence that indicates that health information programmes are most effective when they capture the attention of their target groups. People need to be interested and perceive the information to be relevant and delivered via a trusted source (As discussed in section three of this paper). Impact will also be greatest where there are consistent messages coming from multiple sources[161].
Douglas Solomon, was extensively involved in many early health media campaigns in the USA including the Stanford Heart Disease Prevention Project[162]. Solomon analysed good and bad media campaigns and concluded that campaigns that have been successful owe much of their success to the extensive use of formative research regarding audience and message variables and to the supplementation of media interventions with interpersonal communication within small groups that provide social support and modelling of appropriate behaviours. Solomon [163] [164] proposed a framework for success consisting of four main factors:

1. *Adequate problem analysis* including the setting of detailed objectives (i.e. specific, measurable and reasonable), and audience segmentation.

2. *Appropriate media selection and use* including formative research to provide information about media-use patterns.

3. *Effective message design* determined by specific objective setting, the generation of alternative message approaches, pre-testing and revision of campaign messages.

4. *Evaluation* including the study of both outcome and process evaluation.

[160] McGuire WJ 1986 The myth of massive media impact: savings and salvagings' Public communications and behaviour , vol 1 pp173-220
[161] Coulter A, Ellins J (2007). 'Effectiveness of strategies for informing, educating and involving patients'. *British Medical Journal*, vol 335, no 7609, pp 24–7.
[162] Am J Epidemiol. 1985 Aug;122(2):323-34. The Stanford Five-City Project: design and methods. Farquhar JW, Fortmann SP, Maccoby N, Haskell WL, Williams PT, Flora JA, Taylor CB, Brown BW Jr, Solomon DS, Hulley SB. Available at: http://www.ncbi.nlm.nih.gov/pubmed/4014215

[163] Solomon, D.S. 1982, 'Mass media campaigns in health promotion', *Prevention in Human Services*, vol. 2, nos 1 and 2, pp. 115-23.

[164] Solomon, D.S. 1984, 'Social marketing and community health promotion: the Stanford heart disease prevention program'. In Frederiksen, L.W., Solomon, L.J. & Brehony, K.A. (eds*), Marketing Health Behaviour*, Plennum Press, New York

The following two checklists are offered as 'Proto Tools' for those responsible for information service planning and delivery when considering the role of and how best to design informational programmes.

Proto Tool 2

Checklist: When to use the media

Some of the situations in which media have been found to be most appropriate are:

1. *When wide exposure is desired.* Mass media and digital offer the widest possible exposure. Cost-benefit considerations need to be considered when selecting channels.

2. *When the time frame is urgent.* Mass and digital media offer the best opportunity for reaching either large numbers of people or specific target groups within a short time frame.

3. *When public discussion is likely to facilitate the educational process.* Media messages can be emotional and thought provoking. Because of the possible breadth of coverage, intrusion can occur at many different levels, stimulating discussion and thereby expanding the impact of a message. However, planning needs to be put in place to address counter arguments and views that may arise as part of this process.

4. *When awareness and attitude change are main goals.* All forms of media are awareness- creating tools. Where awareness of a health issue is important to the resolution of that issue, mass and digital media can increase awareness quickly and effectively.

5. *When the mass media sector is 'on*-side'. Where journalists, editors and programmers are supportive and well briefed and open access has been established to on-going expert briefing from public health authorities

6. *When accompanying* on-the-ground back-up can be provided. Regardless of whether media alone may be sufficient to influence health behaviour. Impacts will be more pronounced with the support of back-up community based programmes and services. Most health behaviour changes require constant reinforcement. Media programmes are most effective where the opportunity exists for long-term follow up. This can take the form of short bursts of media activity over an extended period, and or follow up activities related to media intervention.

7. *When a sufficient budget exists.* Paid advertising, especially via television, can be very expensive, and the development and maintenance of bespoke interactive digital services also require substantial funds. Even limited reach media such as pamphlets and posters can be expensive, depending on quality and quantity and the population penetration required.

8. *When the communication goal is simple.* In general, the more complex the targeted change, the more back up is required to supplement informational health programmes.

Proto Tool 3

Checklist for Designing Information Programmes:

1. *Carry out formative research to understand existing attitudes, beliefs knowledge and behaviours. To assist the development of approaches,* research should be undertaken by skilled formative researchers (i.e. run focus groups and surveys).

2. *Understand the audience.* The extent to which a message is attended to, comprehended and used by an audience is largely determined by the extent to which the messenger understands the audience. Detailed profiles of an audience need to be established as a preliminary to media development if a message is to be optimally received.

3. *Communicators and agencies need to be fully and continuously briefed about the topic being communicated and any changes occur during an outbreak.*

4. *Use skilled creative personnel to develop possible interventions and message strategies.* Determining and executing that message in a way that is optimally received and acted upon by a target audience is a highly skilled process. Pre-testing and evaluated during exposure should also be incorporated.

5. *Target the message.* Different sub-groups have different needs, interests, beliefs and attitudes. Hence, different messages – or at least different message executions should be tailored for different groups.

6. *Take account of interpersonal and peer influences.* Campaigns should attempt to stimulate interpersonal contact such as the promotion of group and community activities, and the activation of interpersonal communication networks.

7. *Maximise contact with the message*. Concentrated bursts of spot messages often work better than the same quantity of messages over a long period. Maximising contact also means optimising media within the constraints of

available budgets. On-going campaigns are necessary to maintain awareness and to reinforce attitude behaviour change.

8. *Use multiple channels.* Multiple communication channels (i.e. different media and digital media vehicles plus various non-media channels) tend to have a synergistic effect and can carry different types of information.

9. *Set a realistic duration for the campaign.* Many campaigns have not matched the duration with the desired outcome. Longer campaigns are required to achieve more complex or substantial shifts in attitudes and beliefs, whereas shorter campaigns may be sufficient for changes in awareness and understanding.

10. *Build trust: Use a credible source or spokesperson.* Source credibility is a major factor affecting message acceptance. Spokespersons should be selected based on research results that indicate that they will be credible to the target audience. Pre and on-going testing for credibility is essential.

11. *Do not confuse logic and emotion.* A basic distinction should be drawn between rational and emotional messages in health. A clear rational and if possible evidence and target audience research should be used to devise and select the focus of communications.

12. *Set realistic goals.* Major shifts in attitude and belief are not common in large populations over short periods. Hence it is important that intermediate goals are set. Realistic immediate small changes in attitude, beliefs and knowledge can be used to track progress over time.

13. *Provide environmental supports for change.* Research has shown consistently that most media campaigns require 'on-the-ground' back-up support for optimum effect. To accomplish this, media and social media should be accompanied by strategies associated with community organisations and opportunities for face to face interaction.

14. *Confirm that an information campaign is justifiable.* If an information campaign is justifiable and viable this should be determined early on following the formative research phase. Mass media should be looked at in terms of costs and benefits and these should be compared with other information strategies. If an alternative strategy is projected to be slightly less successful but at much less cost, the goals of a campaign may need to be re-examined.

Theory can consequently make a major contribution to improving the design of programmes and maximising potential effects"[165]

Understanding from Theory and Models

Introduction:

Human behaviour influences and is influenced by many factors including: individual personality and will power, physiology, genetics, culture, evolution, technology, social norms, upbringing, habits, economics, culture and customs. See proto tool 3 in the previous section. This next section of the paper sets out some of the key models and theories of behavioural change that seek to distil these many influences.

There is a key distinction to be made between 'models' of behaviour and 'theories' of change.

Behavioural 'models' seek to explain why people behave in the way they do and help us understand specific behaviours, by identifying the underlying factors which influence them. Whilst 'theories of change' seek to explain how behaviours changes and what might influence it. Theories of change can also help intervention development by suggesting broad approaches to intervention design, implementation and evaluation. However, the language of 'theory' and 'models' do in the literature overlap to a large degree. In addition to the distinction between 'theory' and 'model', Danton[166] notes a further distinction between models:

1. Models of behaviour at the individual level.

2. Models of behaviour at higher levels of scale.

3. Applied models and frameworks.

It is also possible to add to this list of models, 'behaviour change and communication planning models' such as PRECEDE-PROCEED[167], WHO COMBI model [168] P-Process model, [169] STELA model. [170] A review of these and other planning models is included in section **nine** of this paper.

There are large numbers of theories and models and many summary reviews already exist, therefore this section of the paper does not attempt to set out a comprehensive review of all

[165] Green J. The Role of Theory in Evidence Based Health Promotion Practice. Health Educ. Res. 2000 Jan 4;15(2):125-9.
[166] Darnton A. (2008), GSR Behaviour Change Knowledge Review. Reference Report: An overview of behaviour change models and their uses, HMT Publishing Unit, London.

[167] L. Green and M. Kreuter. (2005). Health Promotion Planning: An Educational and Ecological Approach (4 Th Ed.). Mountain View , CA : Mayfield Publishers.
[168] World Health Organization 2002. Communication-for Behavioural-Impact (COMBI) In The Prevention and Control Of TB. WHO Communicable Disease Surveillance (CDS)/Communicable Disease
Prevention, Eradication and Control (CPE) Social Mobilization and Training Programme. Original article available at: http://www.communityhealthjournal.org/pdf/Vol12%281%29-Rozhan.pdf
[169] O'Sullivan, G.A., Yonkler, J.A., Morgan, W., and Merritt, A.P. *A Field Guide to Designing a Health Communication Strategy*, Baltimore, MD: Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs, March 2003
[170] STELA Social Marketing planning model. Available online at: http://stelamodel.com/

theoretical models rather it sets out briefly some of the seminal works and how they can be used to inform the development and delivery of pandemic communication and behaviour change programmes. The next section of this paper looks at a number of attempts to develop comprehensive taxonomies of theories and models and to combine them into meta models that can assist those planning and researching social programmes designed to influence behaviour, understand the interconnections between elements of these models and what this means for decision making about the design of interventions.

Theories can be defined in many ways, but essentially they are composed of a set of interrelated concepts, definitions and propositions that present models of how behaviour is formed or influenced in given situations. Theories are used to mostly describe and in some cases attempt to predict future behavioural responses. Theory is useful because it provides clear frameworks for analysing and conceptualising the process of behavioural influence and change and can also be used guide research on specific behaviours and to assist with the planning and selection of programme interventions.

Theories and models used to guide health communication and behaviour change programmes, assist the understanding of complex sets of influences, however, due to their simplifying nature, they are not capable of providing us with a complete understanding of problems at the individual, political and environmental level[171]. Crosby and Noar have argued that theory is stuck within an "academic vacuum", implying that when applied to the real-world, theory is often not valid[172]. By contrast, we can consider the example given by Green. Green states that an intervention which provides information on condoms to young people:

> *"…will have little effect unless they also have the skills to obtain and use condoms, they are able to be assertive in negotiating condom use with their partner, condoms are available, and so on. Theory can consequently make a major contribution to improving the design of programmes and maximising potential effects"[173].*

This suggests that theory may in fact, be essential for the planning and evaluation of effective health promotion action.

Traditionally many behavioural theories and models have been developed within the discipline of psychology. Examples of some of these models and theories which emphasize the importance of knowledge and beliefs in achieving change include: the health belief model[174], the trans-theoretical model [175] and social cognitive theory[176]. These three models however, are now frequently criticised for being focused on individual issues and not taking account of economic, social or environmental issues which have a big impact on behaviour[177]. As well as newer "ecological" models and theories that do recognise the importance of environmental, social and economic factors, additional new understanding and theory is being developed by economists and brain scientists. This relatively new theory indicates that as well as reasoned action and environmental impacts, many health decisions

[171] Nutbeam D. Using theory to guide changing individual behaviour.I n:Health Promotion Theory. Open University Press.
[172] Crosby R, Noar S. Theory development in health promotion: are we there yet? Journal of Behavioural Medicine. 2010;33(4):259-63.
[173] Green J. The Role of Theory in Evidence Based Health Promotion Practice. Health Educ. Res. 2000 Jan 4;15(2):125-9.
[174] Rosenstock IM (1966), "Why people use health services", Milbank Memorial Fund Quarterly 44 (3): 94–12
[175] Prochaska, J. O., & DiClemente, C. C. (1983) Stages and processes of self-change of smoking: Toward an integrative model of change. Journal of Consulting and Clinical Psychology, 51, 390-395.
[176] Nutbeam D. Using theory to guide changing individual behaviour. In:Health Promotion Theory. Berkshire, UK: Open University Press.
[177] Crosby R, Noar S. Theory development in health promotion. Are we there yet? Journal of Behavioural Medicine. 2010;33(4):259-63.

and a great deal of other behaviours are triggered by rapid cognition or mindless choosing that does not involve rational choice.

The use of theory and models of behavioural influence is not without difficulty or disputes about its helpfulness. For example, a meta-analysis by Park-Higgerson which analyses health promotion interventions on violence, failed to find evidence which suggested that theory-based interventions resulted in better outcomes than those without theory[178]. However, some studies argue that it is in fact the incorrect selection of theory which limits the potential of an intervention and not the inclusion of theory in general[179] [180]. The selection of an inappropriate theory is comprehendible considering there is an excess of theories within the health promotion field. In addition, rather than using one theory, a combination of theories is advocated, as by using more than one theory a problem can be accounted for and evaluated at all theoretical levels[181].

In a recent systematic review to examine the evidence for the effectiveness of interventions that use theories and models of behaviour change in the design and delivery of the prevention and control of communicable disease commissioned by ECDC[182]. Sixty one studies passed the critical screening methodology, twenty one of which were designated of high quality. Nearly all the studies used a communications based approach and were what the authors describe as 'tentative' in their use of new media. There was also a major focus on end used behaviour rather than health professionals or intermediaries. Behaviour change theories and models were used in these studies to either inform the behaviour change intervention programme or were used to design or evaluate the study intervention, There was a strong preference for theories and models focused on individual behaviour. Models of interpersonal behaviour were the next most frequently used, with community and theoretical planning models used less often. Nearly one third of the studies used multiple models.

With regard to the impact of the use of theory on the impact of the programmes, results were mixed. Of the high quality studies focused on prevention nine were successful in meeting their behavioural targets, six were not. Of the eight interventions focused on control six met their behavioural goals two did not. There was no comparative evidence available to state whether using theory made the interventions effective or not. However, the researchers then looked at the characteristics of the successful and unsuccessful programmes. What emerged was that studies that use theory to inform the design and evaluation of interventions, and go beyond the use of just individual theories to encapsulate broader interpersonal and community theory appeared to be more successful. The review also found that only one study evaluated the cost effectiveness of theory based interventions.

So whilst the evidence is not categorical it is reasonable to conclude that the use of theory in both analysis of behavioural challenges and to guide the planning of programme responses

[178] Park-Higgerson H, Perumean-Chaney SE, Bartolucci AA, Grimley DM, Singh KP. The Evaluation of School-based Violence Prevention Programs: A-Meta-Analysis. Journal of School Health. 2008 Sep 1;78(9):465-79.
[179] Aveyard P, Massey L, Parsons A, Manaseki S, Griffin C. The effect of Transtheoretical Model based interventions on smoking cessation. Social Science & Medicine. 2009 Feb;68(3):397-403.
[180] Prochaska JO. Flaws in the theory or flaws in the study: A commentary on 'The effect of Transtheoretical Model based interventions on smoking cessation. Social Science & Medicine. 2009 Feb;68(3):404-6.
[181] Green J, Tones K. Health Promotion: Planning and Strategies. Second. London:Sage;2010.
[182] Angus K, Cairns G Purves R, Bryce S, MacDonald L, Gordon R. Systematic literature review to examine the evidence for the effectiveness of interventions that use theories and models of behaviour change: Towards the prevention and control of communicable diseases. Institute for social marketing University of Stirling & the Open University.2011.Commisioned by ECDC.

providing a broad approach that goes beyond individual based models is applied it is likely to lead to or at least make a contribution to more effective and efficient programme delivery[183] [184]. Using theory can result in better planning, targeting and the setting out of more explicit aims and objectives. Theory can also help interventions more precisely focus on influencing specific elements of a behaviour based on a theoretical conception of what has and or will influence people to behave in the desired way.

Clearly many academic and practical disciplines have a contribution to make to understanding and attempts to influence behaviour. In the public health and health promotion fields the main sources of understanding until comparatively recently have been psychology, sociology, communication studies, media studies, community studies and education. More recently the fields of economics, marketing, design, social networking and economics have also begun to make a contribution. The applied fields of health education, health promotion, community development, health communication and social marketing are used to develop and deliver intervention programmes based on the theories and models derived from these fields of study. Given this wide range of study and applied interpretation a broad range of theoretical models as well as behavioural understanding is available to those seeking to influence awareness and behaviour in the field of pandemic event management.

Many governments[185] and health organisations are attaching increasing importance to behaviour change theory in developing successful policy interventions, in the field of health [186] but also other related social issues such as environment and sustainability[187]. One of the big challenges facing those responsible for developing and delivering communication programmes designed to influence understanding and or behaviour is to understand and make a reasoned selection and use of the many theories that have been articulated to inform their programme design and delivery. The broad scope of theory and models which is continuously expanding can be perceived as a barrier to its use. The literature in the field is "*enormous*" [188] and "*bordering on the unmanageable*"[189]. Time pressured public health professionals may well be reluctant to engage fully with theory and behavioural modelling even though they are aware of the insights it can bring due to this complexity. This broad sweep of theories and models also raises the problem of developing transparent methods or process for selecting models or elements from multiple models to guide public health work in a given situation with a selected segment of the population.

This section of the paper aims to set out a selection of the most quoted and most widely used theories and models and present a set of proto tools to assist practitioners with an understanding of current studies about influencing behaviour and how to begin to use theory in the construction of health campaigns. This section is not intended to be a comprehensive review of all relevant models and theories rather it sites a number of often quoted models that have relevance to pandemic communication and behaviour change programme development.

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[183] Roe, L., Hunt, P., Bradshaw, H. et al. (1997) *Health Promotion Effectiveness Reviews 6: Health Promotion Interventions to Promote Healthy Eating in the General Population: a review.* London: Health Education Authority.
[184] Halpern, D, C Bates and G Beales 2003. *Personal Responsibility and Behaviour Change*. Prime Minister's Strategy Unit, Cabinet Office. London.
[185] Darnton A (2008), GSR Behaviour Change Knowledge Review. Reference Report: An overview of behaviour change models and their uses, HMT Publishing Unit, London.

[186] COI Research Unit, Communications and behaviour change. COI. London. 2010
[187] T Motivating Sustainable Consumption: A Review of Evidence on Consumer Behaviour and Behavioural Change A report to the Sustainable Development Research Network, 2005 and Defra, A Framework for Pro-Environmental Behaviours, Report and Annexes 2008
[188] Maio, G, B Verplanken, A Manstead, W Stroebe, C Abraham, P Sheeran and M Conner 2007. Social Psychological Factors in Lifestyle Change and Their Relevance to Policy. Journal of Social Issues and Policy Review, 1 (1) 99-137.
[189] Jackson, T 2005. Motivating Sustainable Consumption: A Review Of Evidence On Consumer Behaviour And Behavioural Change. A report to the Sustainable Development Research Network. London: SDRN.

There are many different ways to classify and describe the wide range of behavioural theory and models that exist. For the purpose of this paper these theories and models are set out under the following headings:

- Individual level theories - describing the behaviour of individuals (theories of cognition, perceptions and motivation)
- Interpersonal level theories – describing the relationships between individuals (theories of social norms and social influence)
- Community / group theories – stressing the dynamics of community structures or institutions, theories of community mobilisation, inter-sectorial action and organisational change.
- Big systems theories and models dealing with multiple influencing factors.
- Health focused theories and models.

Individual Level Theories

There are a wide range of individually focused behaviour change theories. The individual focused theories and models set out below (Based of summaries by Mulgan et al [190] and COI)[191] are some of the most commonly used to explain factors that impact on individual behaviour and have been used extensively in the health sector.[192] Many of these models explore factors such as knowledge, attitudes, beliefs, motivation, self-concept, learning, past experience and skills and self perception as key determinants of behaviour.

Instrumental and Classical Conditioning

Seminal work: Pavlov (1927)[193]Skinner 1953[194]

This model based on empirical experimentation with both animals and humans emphasises the impact on learning of associations between stimuli and the subsequent impacts on behaviour. Classical conditioning occurs when an 'unconditioned stimulus', such as food, becomes associated with another stimulus, such as a bell. The establishment of such associations can be applied in many ways to set up either positive or negative associations and so influence behaviour. Classical conditioning theory can be applied in many fields associated with complex human behaviour as well as simple animal response situations. Even highly complex human behaviours can often be explained through long chains of such associations.

[190] Mulgan G, Aldridge S, Beales G, Heathfield A, Halpen D, Bates C .Personal Responsibility and Changing Behaviour: the state of knowledge and its implications for public policy. Prime Minister's Strategy Unit. February 2004

[191] Central Office of Information. Communications and behavior change. COI / GCN. London. 2009
[192] Darnton op.cit., Glanz, Karen and Rimer, Barbara K. *Theory at a Glance*: A Guide for Health Promotion Practice Second Edition National Cancer Institute, National Institutes of Health, U.S. Department of Health and Human Services. 2005
[193] Pavlov, I.P. (1927). *Conditioned Reflexes*. London: Oxford University Press.
[194] Skinner, B.F. (1953). *Science and Human Behavior*. New York: Macmillan.

Cognitive Consistency and Dissonance Theory

Seminal work: Festinger, 1957[195]

The 'cognitive consistency theory' proposes that people are motivated to seek consistency between their beliefs, values, and perceptions. The theory postulates that where there is a clash between people's actions and values or attitudes, people often resolve the discrepancy by changing their values or attitudes rather than their behaviour. For example, if someone agrees to take on a boring task for a very limited reward, there is a 'dissonance' between their behaviour (doing the task) and their reasoning (they would only do a boring task if there's a decent reward). One way out of this dissonance is to stop doing the task – i.e. change the behaviour, another is to change their attitude – i.e. convince themselves that the task is actually quite interesting.

Cognitive dissonance can be used in public health programmes through a process of highlighting clashes of behaviour and attitudes for example by highlighting differences in favourable attitudes to hand washing and actual poor practice as a way of triggering change.

'Heuristics' and the Consumer Information-Processing Model

Seminal work: Tversky and Kahneman, (1974[196]*; Bettman (1979)*[197]

Tversky and Kahneman have documented in detail how humans use mental shortcuts, or 'heuristics' to make sense of their world and decision making and the impact this has on behaviour. Under normal circumstances heuristics do not present a problem, but in certain situations the use of these mental short-cuts can make people systematically prone to misjudgement and biases. Central assumptions are that: individuals are limited in how much information they can process; and in order to increase the usability of information, they combine bits of information into 'chunks', and employ decision rules, to make choices faster and in a less stressful way. Major heuristics include ones relating to:

Availability and *stimulation, scarcity, fear of loss, peak experience and "recency" and discounting over time. All of these potential biases can have large effects on health related behaviour. For example fear of loss, e.g. loss of physical functioning or mental capacity is often a better approach to framing public health messages than emphasising the gains that people may get in terms of protection from the adoption of a recommended behaviour.*

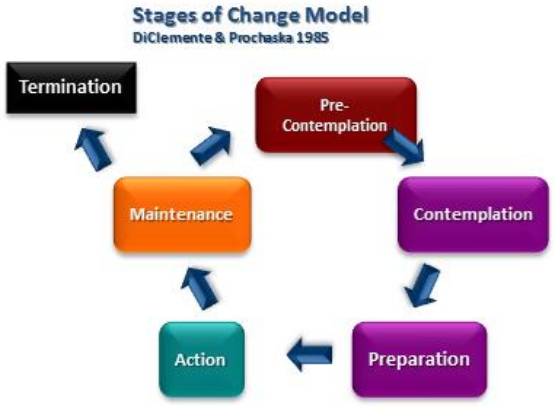
[195] Festinger, L. (1957) *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press.
[196] Tversky, A., & Kahneman. D. (1974) *Judgment under uncertainty: Heuristics and biases*. Science 185:1124-1131.
[197] Bettman, J. R. (1979) *An Information Processing Theory of Consumer Choice*. Reading, Mass.: Addison-Wesley.

Stages of Change or Transtheoretical Model.

Seminal work: Prochaska & DiClemente (1983)[198]

This is perhaps one of the best known and most quoted models used in many public health interventions. It proposes five stages of people's readiness to change or attempts to change. The stages are not necessarily passed through sequentially. The stages of change models treats behaviour change as a linear process with discrete ordered stages. People can enter and exit at any point, and often 'recycle' through stages of change. This model has influenced methods of social marketing which gradually build people's willingness to take on large-scale behaviour changes.

The model is useful as it identifies that there are different elements/stages to behaviour change and it attempts to disentangle these complex processes; therefore enabling practitioners to both segment audiences and develop interventions for people at different stages of change. One of the key limitations of the model is that it does not explain what the triggers to the different stages are, nevertheless insights from other psychology models and from behavioural economics and social marketing may help to address this gap.



[198] Prochaska, J. O., & DiClemente, C. C. (1983) *Stages and processes of self-change of smoking: Toward an integrative model of change*. Journal of Consulting and Clinical Psychology, 51, 390-395.

Theory of Planned Behaviour, Reasoned Action

Seminal works: Fishbein and Ajzen (1975)[199]; Ajzen (1985)[200]

The theory of Planned Behaviour and its precursor the Theory of Reasoned Action examine the relationship between behaviour and psychological issues such as beliefs, attitudes and intentions. The model was originally based on the assumption that human beings are rational and that behaviours are therefore under their control and develop for a set of reasoned decisions. However, in the 1990's, Ajzen and Driver added an element which acknowledged the importance of factors beyond the individual's control, which impact on ability to change behaviour. This became known as the Theory of Planned Behaviour which has been used by many public health programmes. The theory holds that 'behavioural intention' is the key determinant of behaviour and that an individual's attitude towards performing behaviour is one of the biggest influences on behavioural intention. Subjective norms, are beliefs about what others think about the behaviour under consideration, this is seen as having a key impact on behavioural intention.

The Theory of Planned Behaviour adds, Perceived behavioural control, this is the amount of control an individual perceives they have over a behaviour and explains when behaviour or behavioural intention is influenced by factors beyond an individual's perceived control. In highlighting the importance of subjective norms, i.e. the perceived beliefs of others as well as individual attitudes and characteristics, the theory provides a conceptual link to interpersonal and community theories of behaviour change. The theory also highlights why knowledge alone doesn't necessarily lead to a change in a person's behaviour.

Protection-Motivation Theory

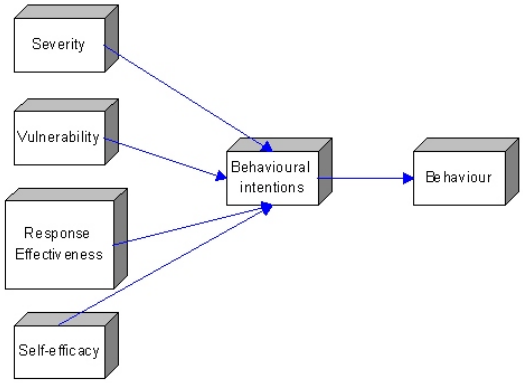
Seminal work: Rogers 1975:[201]

Protection-motivation theory (PMT) considers that behaviour change may be achieved by appealing to an individual's fears. It identifies three components of fear arousal: The magnitude of harm of a depicted event; the probability of that event's occurrence and the efficacy of the proposed protective response. PMT suggested that these components combine to determine the intensity of the protection motivation resulting in activity

[199] Fishbein, M. and Azjen, I. (1975) *Belief, attitude, intention and behaviour. An introduction to theory and research*. Reading, Massachusetts: Addison-Wesley Publishing.
[200] Ajzen, I. (1985) *From intentions to actions: A theory of planned behaviour.* In Kuhl, J. & Beckman, J. (Eds.) *Action-control: From cognition to behaviour* (pp. 11-39). Heidelberg: Springer.
[201] Rogers RW: A protection motivation theory of fear appeals and attitude change. J Psychol 1975 , 91:93-114.

occurring as a result of a desire to protect oneself from danger. This theory explicitly uses the costs and benefits of existing and recommended behaviour to predict the likelihood of behaviour change[202]. The most recent version of the theory assumes that the motivation to protect oneself from danger is a positive linear function of beliefs that the threat is severe, that the individual is personally vulnerable and that the individual can perform the coping response and that the coping response is effective at reducing or eliminating risk. This theory has influenced many public health programmes that deal with risks associated with infections. The implication of the theory is that people need to recognise risks, their vulnerability to the risk and believe the efficacy of the recommended action.

Protection-motivation theory



Interpersonal Level Theories

Interpersonal models and theories focus on the wider social interactions and environment and how this impacts on behaviour. These models assume that people are strongly influenced by the opinions, views, beliefs and the values of people that they interact with especially close relations and significant people in their lives. These models also explore how significant others can assist or detract from social responsible decisions. This focus is key in terms of developing influencing strategies as it may be possible to develop interventions that target one group with the aim of influencing another. Behaviour change is often better effected by focusing not just on individuals, but also on their relationships with those around them.

These models cover both small micro environmental social influences such as the views of close family members but also larger social effects such as the impact of public opinions, the influence of social norms and how changes in these spread across populations. Examples include interventions that focus on the use of social networks, peer support, role models and mentors, to influence behaviour and attitudes.

[202] Gebhardt WA, Maes S: Integrating social-psychological frameworks for health behaviour research. Am J Health Beh 2001 , 25:528-536.

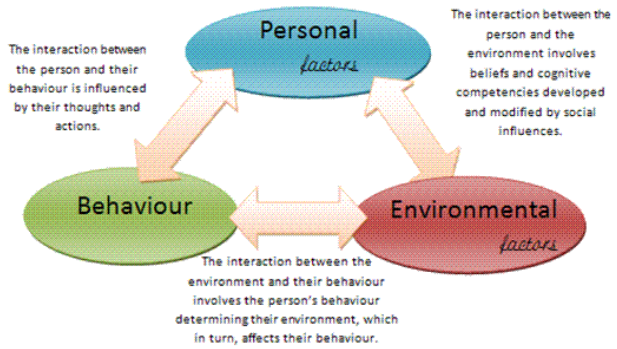
Social Cognitive Theory

Seminal work: Bandura (1986)[203] [204]

This theory focuses on skill and competency, and emphasises the importance of enhancing a person's behavioural capability and self-confidence. In social cognitive theory (SCT), human behaviour is explained in terms of how personal factors, environmental influences and behaviour continually interact. SCT postulates that behaviour can be influenced by increasing knowledge and skills. SCT asserts that human behaviour is directly shaped by an individual's competencies and their beliefs in their own capabilities. Bandura argues that human behaviour is a result of the constant interplay of *personal factors* (cognitive, affective/emotional and biological events), *environmental* (external) factors and how people interpret the results of their *behaviour*. People make things happen by their own actions, drawing on a range of personal factors, including habits of thinking and self beliefs.

SCT is based on the view that humans are instilled with certain capabilities including: the capacity to *Symbolize* (which enables us to extract meaning from the environment around us and solve problems). *Forethought:* (A capability to plan courses of action, anticipate and set goals). *Vicarious learning:* (The ability to observe and learn from others) *Self regulation:* (The potential for self-directed change). *Self reflection:* (Enabling us to make sense of our experiences and self evaluation). SCT holds that each of us has different levels of these capabilities and types of skill and competencies. Key to SCT is the concept of 'self efficacy'. Self efficacy determines how we feel and think about ourselves and ultimately how we behave. Belief in self-efficacy can have diverse effects; it can determine the amount of effort and perseverance people put into a task and how much resilience they display in adverse or challenging situations. Importantly, what we believe we are capable of may actually differ from what we can actually do.

Bandura believes that people's self-beliefs are more likely to influence what they do than their actual skills and competencies. Self-efficacy beliefs are influenced by four main sources: *Mastery experiences*: that is personal experience of our own successes and failures. *Vicarious experiences*: observing the success and failure of others. *Social persuasion*: the direct influence of those around us and finally *Somatic and Emotional states* i.e. stress, anxiety, positive and negative moods which can affect people's judgements of their personal efficacy as can the physical condition or state of their body, for example how tired a person is or how hungry.



[203] Bandura, A.1986 Social Foundations of Thought and Action: A Social Cognitive Theory. Englewood Cliffs, NJ: Prentice Hall.
[204] Bandura, A 1977. Self-efficacy: toward a unifying theory of behavioral change. Psychological Review 84, 191–215.

Social Networks and Social Support

Seminal work: House (1981)[205]

According to House a social network is a web of social relationships, which is characterised by a number of actions and states of mind including: Reciprocity (The behaviour of both, giving and receiving or exchanging mutually beneficial goods, services or support) and emotional closeness and social support. An effective social network is also characterised by the extent to which members interact and get to know each other. Additional actors in the creation and maintenance of effective social networks that provide support relate to how similar members of the network are in terms of their demographics but also intellectual, emotional and belief systems. Other factors include ease of communication and assembly such as geographical dispersion or compactness. Social support is characterised as a form of aid and assistance which is exchanged through social networks. According to this theory some of the most powerful influences on a person's behaviour and views will be formed and supported by the attitudes and resources within a person's social network. One of the consequences of this is that the theory indicates that people will be far more influenced by the views and actions of friends and family than by advice from government or professionals not within their social network.

Social Influence and Interpersonal Communication theory

Seminal work: Kelly & Thibaut (1978)[206]

According to Kelly and Thibaut interpersonal communication is influenced by a number of factors associated with both the nature of the person that is seeking to exert influence and the form or type of influencing strategy that is being applied. Interpersonal social influence is influenced strongly by both the perceived power and the authority that is invested in the person seeking to exert influence by the person being influenced. According to this theory the basis of power or authority in a relationship may be categorised in six ways:

1. ***Expert*** – someone else is more knowledgeable.

2. ***Legitimate*** – someone has the 'right' to direct behaviour derived from a recognised social role that is imbued with credibility and authority.

3. ***Coercive*** – when another has the power to punish.

4. ***Reward*** – when another has the power to reward.

5. ***Informational*** – the person who is seeking to persuade holds important information of value to the receiver.

6. ***Referent*** – Power is based on *identification* with the person trying to exert influence. This is among the most effective sources of power and is affected by factors such as 'liking' or empathy with the persuader.

Perceived power and authority are key factors in communication and persuasion and may often assist with securing 'compliance' with recommended actions.

[205] House, JS. (1981) *Work, stress and social support*. Reading Mass. US: Addison-Wesley.
[206] Kelly HH, & Thibaut JW (1978) *Interpersonal relations: a theory of interdependence*. New York: Wiley.

Attribution and balance theories

Seminal work: Heider (1958)[207]

These are theories concerning how people explain the behaviour of their own and other people. Phenomena identified by these theories include: **F*undamental attribution error,*** this refers to the human tendency to over-emphasise *dispositional (Personal attributes) factors* about people, and under-emphasise *situational (Environmental)* factors. An example in the field of vaccination would be attributing a person's failure to become vaccinated to their laziness about coming forward rather than difficulties associated with access to a service provider. ***False uniqueness*** is the human tendencies to hold an exaggerated view of our own positive qualities and abilities. Most people also tend to underestimate others abilities as well as over emphasising our own. ***False consensus*** is the tendency that people have to overestimate the extent to which others agree with their own views and beliefs. ***Inter-group bias*** refers to similar self-serving attribution biases, but at the group level. People attribute disproportionately good qualities and virtues to groups they belong to and or identify with, while seeing members of other groups as possessing fewer positive qualities. An implication of these theories is that care needs to be taken to understand how these heuristics may be used to interpret efforts to create change or compliance with public health recommendations.

Theory of Interpersonal Behaviour (TIB)

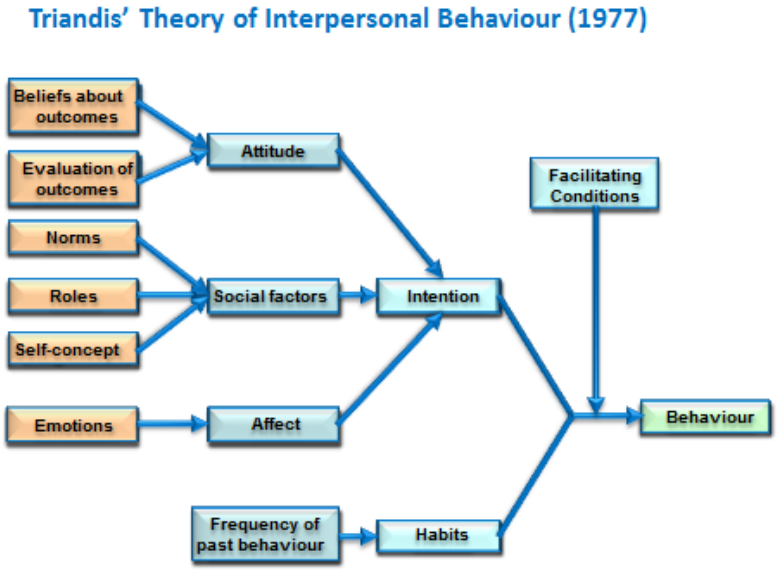
Seminal work: Triandis 1977[208].

This theory takes account for individuals less rational decision making and the impact of habit on influencing behaviour. Habit is defined as a separate and key causal factor in the model, alongside attitudes, norms, roles, self-concept, beliefs and attitudes to likely outcomes. The model gives significant emphasis to the power of habit running parallel to intentions in determining behaviour. TIB indicates that our behaviour can sometimes be utterly unplanned and unconscious. TIB has been shown to be a good or better predictor of behaviour in situations where there is a significant habitual component. Embodied in the model is the thesis that our behaviour can follow two different paths: a deliberative path (via intentions) and an automatic path (via habits). This duel path theory or what has been called systems one and systems two thinking will be further explored in section seven of this paper. Put simply, System 1 cognition is fast, easy and automatic, while System 2 is slow and deliberate. The two Systems run in parallel: much of our behaviour is automatic and directed by System 1, but on occasions we perform careful deliberation, and that occurs in System 2 but this type of decision making is hard and we soon tire of it. Habits are bound up in this thinking, the two paths or processes run in parallel, one

[207] Heider, F. 1958. *The Psychology of Inter-Personal Relations.* NY: Wiley. Section 7: Sentiment pp.174-217.
[208] Triandis, H 1977. *Inter-personal Behaviour.* Monterey, CA: Brooks/Cole. Vare P and W Scott 2007. Learning for a Change: Exploring the Relationship Between Education and Sustainable

moderating the influence of the other: we are rarely purely deliberative or purely habitual in our behaviour.

The implications of TIB for policy makers and practitioners in the public health field is that much of our behaviour and much of our decision making is simply automatic or habitual, therefore appeals based on rational choice may have little influence on behaviour if the behaviour in question is following the habitual path. The best predictor of people's future behaviour is how they have behaved in the past or to study their habits.



Community/Group Theories

Recent developments in the understanding of behaviour have focused on the importance of behaviour in a community context; there is clearly a great deal of overlap between these theories and those that relate to interpersonal influence. These theories and models explore how social systems function and change and their impact on individuals and influencers. They also aim to explain how behaviour change can be encouraged in groups and organisations. Clearly such models have utility in informing and understanding approaches to influencing communities, the mobilization of inter-sectorial co-operation and inter-organisational change, as well as a key impact on health communications and attempts to individuals influence behaviour.

Social Capital Theory

Seminal works: Bourdieu (1986)[209], Coleman (1988)[210] Putnam R (1995)[211]

The 'Social capital' concept or theory holds that social capital exists and can be measured in a community and that it is made up of the quantity and quality of social

[209] Bourdieu, P. (1986) *The Forms of Capital* in Baron, S., Field, J. and Schuller, T. (eds.) (2000) *Social Capital - Critical Perspectives.* Oxford University Press.
[210] Coleman, J. (1988) *Social Capital in the Creation of Human Capital* American Journal of Sociology 94 Supplement S95-S120. University of Chicago.
[211] Putnam, R (1995) *Bowling Alone: America's Declining Social Capital* Journal of Democracy 6 (1) 65-78.

networks and personal relationships, and the co-operative quality of a society's social interactions. Social capital can also be discerned through observation of the consistency of application of social norms and values of how a community informally and formally shapes the quantity of social interactions. The core insight of this theory is that social networks and co-operative social norms have positive personal value to individuals and to wider communities.

Three types of social capital are often distinguished: *bonding* social capital (e.g. among family members or ethnic groups); *bridging* social capital (e.g. across ethnic groups); and *linking* social capital (e.g. across political classes).Variations in the strength or weakness of social capital are reflected in and may partly explain variations in key social outcomes, including, crime rates, educational performance, mortality and morbidity and economic performance. A key implication of this theory is that one of the prerequisites for effective social programmes may be the need to build, enhance or incentivise the development of social capital.

Diffusion of Innovations (DI)

Seminal work: Rogers & Everett (1995)[212]

Diffusion of Innovations theory addresses how new ideas, products, and social practices spread within a society or from one society to another. Diffusion is facilitated through five key concepts, relative advantage, compatibility, complexity, observability and trialling. **Relative advantage** is the extent to which an innovation is better than what it replaces. An innovation can be a product, service idea, a behaviour programme or policy. An innovation presents a clear choice for an individual to continue with an inferior activity or embrace a superior one. **Compatibility** this concept describes how well the innovation fits with the values, habits, experience and needs of the intended audience. **Complexity** acknowledges that people are more likely to make a behaviour change if the suggested innovation is easy to implement. **Trialability** refers to the concept of 'try before you buy' with innovations being more likely to succeed if individuals can try them before committing totally to a behaviour. **Observability** indicates how likely the innovation will be to produce tangible results and also how socially visible is it to other people who often want other people to be able to see that they are taking up new behaviours or have bought new products.

DI theory indicates that populations can be classified by their approach to new innovations into five groups:

Innovators: This relatively small group will be the first to adopt the new innovations. They place a great deal of value on being the first to get the benefits of the new innovation and being seen to be innovators by other groups. They strongly influence the next group, the Early Adopters.

Early Adopters: This is the second fastest category of individuals who adopt an innovation. These individuals have the highest degree of opinion leadership among the other adopter categories. Early Adopters are typically younger in age, have a higher social status, have more financial lucidity, advanced education, and are more socially forward than late adopters.

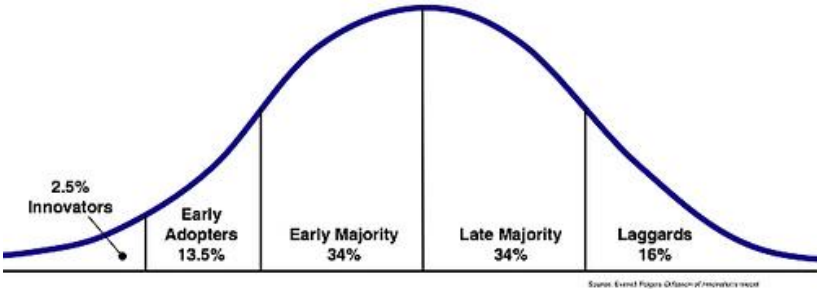
[212] Rogers and Everett. (1995) *Diffusion of Innovations*. Fourth edition. New York, NY: The Free Press.

Early Majority Adopters: Individuals in this category adopt an innovation after a varying degree of time. The time of adoption is significantly longer than the innovators and early adopters. Early Majority Adopters tend to have above average social status, contact with early adopters, and show some opinion leadership.

Late Majority Adopters: Individuals in this category will adopt an innovation after the average member of the society. The Late Majority Adopters are typically sceptical about an innovation, have below average social status and often have less financial resources. They are in contact with others in late majority and early majority, but very little opinion leadership.

Laggards: Individuals in this category are the last to adopt an innovation. These individuals typically have an aversion to change and change-agents and tend to be older. Laggards typically tend to be focused on "traditional solutions" and have low social status and fewer financial resources. They are in contact with family and close friends but have very little to no opinion leadership with other categories.

The rates of adoption for innovations are determined by an individual's adopter category. In general individuals who first adopt an innovation require a shorter adoption period than late adopters. Within the rate of adoption there is a point at which an innovation reaches critical mass or tipping point[213]. This is a point in time within the adoption curve that enough individuals have adopted an innovation in order that the continued adoption of the innovation is self-sustaining. In describing how an innovation reaches critical mass, Rogers outlines several strategies in order to help an innovation reach this stage. These strategies all have relevance for public health interventions, have the innovation endorsed and adopted by a highly respected individual within a social network, creating an instinctive desire for a specific innovation; inject an innovation into a group of individuals who would readily use an innovation and provide positive reactions and benefits for early adopters of an innovation.



Big Systems Theory

There is a growing consensus in many fields that health focused behavioural interventions should be based on what has been described as an 'Ecological model' [214]. An ecological model [215] approach views human behaviour as a form of complex ecology with multiple influences. Health behaviour in this conception is influenced by a dynamic interaction between biology, psychological factors and environmental influences. The relationship and

[213] Gladwell M. The Tipping Point. Back Bay Books 2004
[214] Smedley BD, Syme SL (eds.), Institute of Medicine. Promoting Health: Strategies from Social and Behavioral Research. Washington, D.C.:, National Academies Press, 2000.
[215] National Institutes of Health. Theory at a glance, Second edition. A guide for Health Promotion Practice. National Cancer Institute. US Department of Health and Human Services. Available to down load at: http://www.cancer.gov/PDF/481f5d53-63df-41bc-bfaf-5aa48ee1da4d/TAAG3.pdf. 2005.

influence of these factors is not static over time and can change depending on the life course stage of individuals. The following three examples of complex ecological systems set out below are complemented by the Dalgren and Whitehead model[216] in the following section on health focused models.

Systems Thinking and Change

Seminal works Argyris, C and D Schon 1996[217]. Senge 1990 [218]

Systems thinking is a theory developed as an approach to problem solving. Many of our current social problems are conceived as consequences of wider complex social systems. The central premise of systems thinking is that systems have "*emergent properties*" and the components of these systems interact to create effects which the components could not have generated on their own. Systems are believed to exhibit the following characteristics, they are: Self-organizing, Non-linear, Constantly changing, History dependent, Tightly linked, Counter-intuitive, Governed by feedback and Resistant to change[219]. Systems thinking is focused on understanding the total system of influences and how its components interact in a holistic way rather than dissembling factors through a process of individually analysing individual elements. In this way systems thinking is the exact opposite of much public health analysis that seeks to disassemble complex problems into discrete components that can be studied. Senge makes the distinction between 'detail complexity', which traditional analysis can deal with by disassembly, and 'dynamic complexity' which involves systemic interactions over time, and generates emergent properties. In the context of influences on behaviour the feedback loop is the central construct in systems thinking. Behaviour in systems thinking develops through continuous positive and negative feedback loops rather than through simple cause and effect relationships. Systems thinking also makes the distinction between transformational and incremental change. Transformational change requires the kind of deep insight that can expose and reshape underlying assumptions, whereas incremental change works within the existing structure. Systems thinking, challenges the traditional approaches to behaviour change, which use theory to identify what works so it can be replicated elsewhere. In contrast systems thinking proposes an approach of reflective practice and continuous inquiry not the implementing of set approaches or theories. Systems thinking methods are particularly good for approaching messy problems, where diverse stakeholders are involved and cause and effects are multiple. Collective diagnosis of problems and collective development of solutions are key elements of systems thinking and organisational change models. Systems thinking is advocated by WHO[220], who have identified a ten step approach to systems thinking in the health sector:

1. Convene stakeholders.
2. Determine indicators.
3. Collectively brainstorm.
4. Choose methods.
5. Conceptualize effects.
6. Select design.
7. Adapt and redesign.

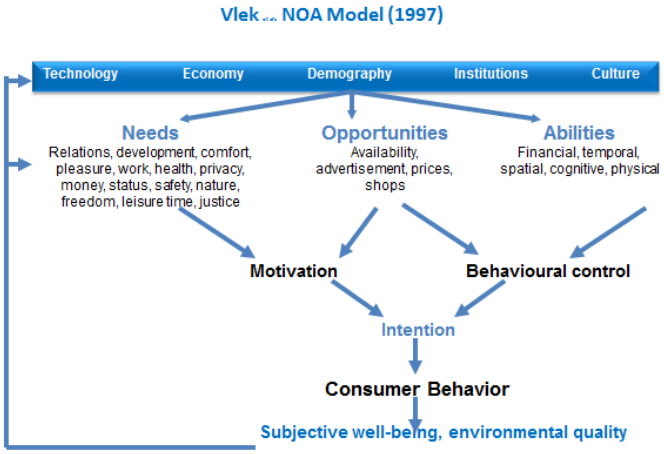
[216] Dahlgren G. Whitehead M, *Policies and strategies to promote social equity in health*, Institute of Futures Studies, Stockholm, 1991
[217] Argyris, C and D Schon 1996. Organizational Learning II. Reading, Massachusetts: Addison Wesley.
[218] Senge, P 1990. The Fifth Discipline. London: Random House.
[219] Sterman J. Learning from evidence in a complex world. American Journal Public Health, 2006, 96(3):505-514.
[220] Don de Savigny and Taghreed Adam (Eds). Systems thinking for health systems strengthening. Alliance for Health Policy and Systems Research, WHO, 2009

8. Develop plan.
9. Set budget.
10. Source funding.

The Needs, Opportunities & Abilities Model

Seminal work: Gatersleben and Vlek 1998[221]

The Needs, Opportunity, Ability (NOA) model of consumer behaviour is a good example of an ecological model that explicitly incorporates factors at the environmental level. NOA consists of an intention-based model of individual behaviour 'nested' within a model that shows the influence of macro-level environmental factors. At the individual level, intentions are formed through both 'motivation' (which is driven by needs and opportunities) and 'behavioural control' or agency (which is driven by opportunities and abilities). "At the macro level, needs, opportunities and abilities are influenced by the five environmental factors: technology, economy, demography, institutions and culture. The model shows a two-way relationship between environmental factors and consumer behaviour, with a large 'feedback loop' linking the top and bottom levels"[222]. NAO provides a valuable demonstration of how macro factors can influence behaviour and shows clearly that focusing only on personal factors may not bring about change.



The NOA model also shows how consumer behaviour influences societal factors, by means of a feedback loop. One of the key implications of the model is the need to work at multiple levels of influence to generate change in behaviour across a social system focusing on needs, opportunities and ensuring people have the ability to change.

[221] Gatersleben, B and C Vlek 1998. *Household Consumption. Quality of Life and Environmental Impacts*. In Noorman, KJ and AJM Schoot-Uiterkamp (eds.) Green Households? Domestic Consumers, Environment and Sustainability. London: Earthscan, 141-183

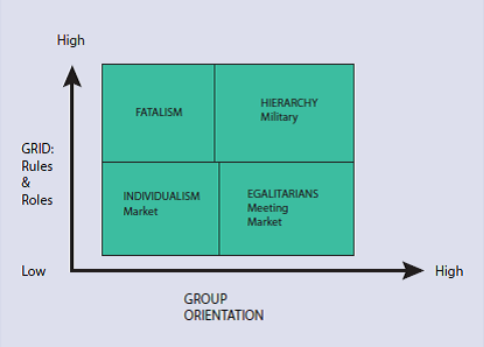
[222] Darnton A .GSR Behaviour Change Knowledge Review Reference Report: An overview of behaviour change models and their uses , Centre for Sustainable Development, University of Westminster. 2008

Cultural Theory

Seminal works: Douglas & Widavsky 1982,[223] Douglas 1992 [224]

Cultural theory is a conceptual framework that was originally developed to explain societal conflict over risk. Cultural Theory asserts that structures of social organisation such as its rules, structures and how these rules are controlled by societies endow individuals with perceptions that reinforce those structures in competition against alternative views. Cultural theory sets out four types of understandings that can be found in different societies or groups: **Egalitarian, Individualist, Hierarchical and Fatalist**. The particular domination of any of these types of understanding in different cultures depends on two different criteria: **Grid issues:** rules and individual roles and: **Group orientation**: the importance of collective control and consensus within the group or society. Where there is high Grid and Group orientations, there will tend to be hierarchical cultures. Conversely, where there are low Grid and Group tendencies, there will tend to be more individualist cultures.

The key practical public health implication of this theory within a European context is that efforts to address behaviour change and develop effective communication interventions in relation to pandemic preparedness will need to be informed by and reflect all of these different cultural understandings if change is to be delivered across diverse communities within Europe. Since every community contains some element of Grid and Group diversity, efforts at tackling problems are unlikely to bear fruit unless they accommodate each perspective. The theory therefore indicates that a mixture of rules (Hierarchicalism), norms and community values (Egalitarianism) and incentives and support structures (Individualism) will all be needed to deliver effective behaviour change programmes.



[223] *Douglas, M. (1992). Risk and Blame: Essays in Cultural Theory. London: New York: Routledge.*

[224] *Douglas, M., & Wildavsky, A. B. (1982). Risk and Culture: An essay on the selection of technical and environmental dangers. Berkeley: University of California Pre*

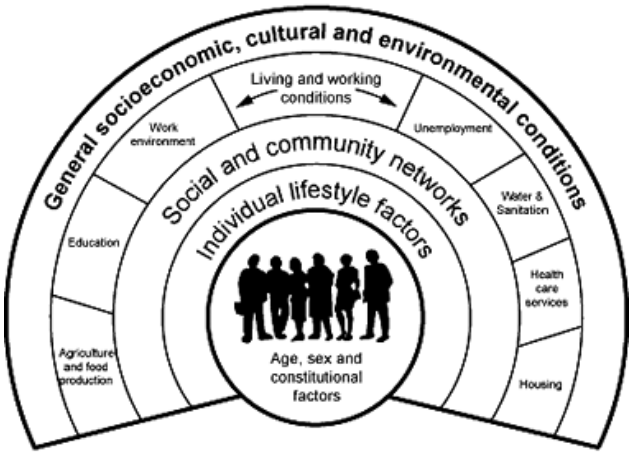
Health Focused Theories

Determinants of Health Model

Seminal Work: Dahlgren and Whitehead 1991[225].

The Determinant of Health (DoH) model is a big systems model focused on the key factors that impact on an individual or communities health. The DoH model is represented diagrammatically as a rainbow-like set of tiers of social, economic and behavioural factors surrounding individuals whose biological variables (e.g. age, sex and genetics) are fixed at the centre of the model. The model illustrates four tiers, and describes intervention types for each one, as follows. The top tier is the macro-level 'structural environment'. The next tier is 'material living conditions', including housing, education and the workplace (subject to legislation/regulation and the provision of public services). Moving closer to the individual, the third tier is 'material support networks' including family and friends (subject to strengthening networks and building community capacity). The closest tier is 'lifestyle/behavioural factors' (subject to influencing interventions, including the provision of information). This model is widely quoted in many public health strategy and policy documents as a helpful summary of the influences on health.

The implication of the model is that public health action should be focused on the determinants of health at every level of the model. A further implication of the model is that action is needed on the detriments or causes of poor health rather than a focus on the consequences or ultimate symptoms of poor health brought about by individual behaviour. In the field of 'pandemic preparedness' the implication would be the need to strengthen community resilience and macro-economic policy as components of strategies.



[225] Dahlgren G. Whitehead M, *Policies and strategies to promote social equity in health*, Institute of Futures Studies, Stockholm, 1991

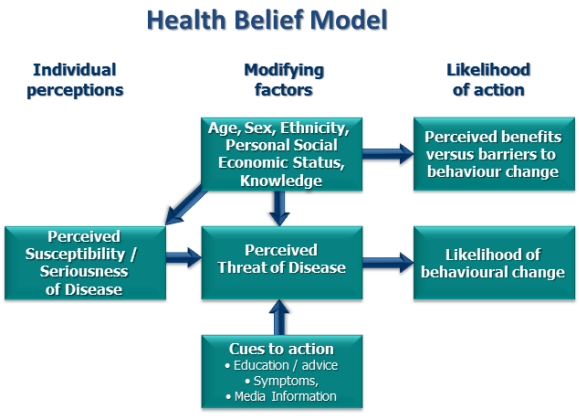
Health Belief Model

Seminal work Rosenstock [226]

The health belief model was one of the first social cognition models focused on health decision making and behaviour. The model was further developed by Janz and Becker[227] and colleagues in the 1970s and 1980s. Subsequent amendments to the model were made to accommodate evolving evidence generated within the health community about the role that knowledge and perceptions play in personal responsibility. The model suggests that belief in a personal threat together with a belief in the effectiveness of the proposed behaviour will predict the likelihood of a behaviour. The four key constructs of the model are:

- Perceived susceptibility (An individual's assessment of their risk of getting the condition).
- Perceived severity (An individual's assessment of the seriousness of the condition, and its potential consequences).
- Perceived barriers (An individual's assessment of the influences that facilitate or discourage adoption of the promoted behaviour).
- Perceived benefits (An individual's assessment of the positive consequences of adopting the behaviour).

A number of mediating factors have been added to the model, these include demographic and socio-psychological variables. Rosenstock argues these variables on their own do not necessarily mean that an individual will be motivated to carry out the desired health behaviour. He points to the importance of 'cues to action' to prompt a change in behaviour. These cues are events either 'bodily' (e.g. physical symptoms of a health condition) or environmental (e.g. media publicity). There are some general limitations to the Health Belief Model that need to be borne in mind, it does not specify how different beliefs influence each other, it does not take into account environmental or economic factors that may influence health behaviours and it does not overtly consider the influence of others on people's decisions. The model however, does indicate that a focus of threat, perceived vulnerability and the efficacy of recommended actions should all form part of any approach to pandemic communication and behaviour change.



[226] Rosenstock IM (1966), "Why people use health services", Milbank Memorial Fund Quarterly 44 (3): 94–12

[227] Janz, N. K.; Becker, M. H. (1 January 1984). "The Health Belief Model: A Decade Later". Health Education & Behavior 11 (1): 1–47

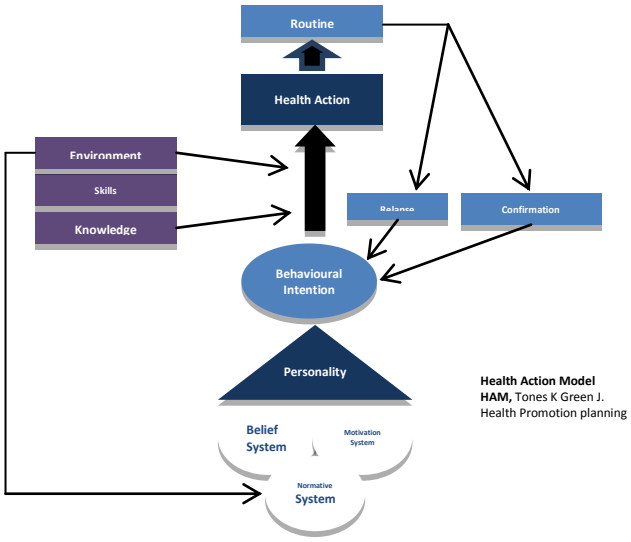
Heath Action Model

Seminal Work Tones 1990 [228] [229]

The Health Action Model (HAM), conceptually incorporates the Health Belief Model and Ajzen and Fishbein's Theory of Reasoned Action. The HAM takes account of beliefs, normative influences and motivating factors, including attitudes, along with other strong motivating forces, such as hunger, pain, pleasure and sex, in order to understand behaviour. Identity and self-esteem are key factors introduced by this model as important mediating factors. Self-esteem encompasses appearance, intelligence and physical skills, as well as an individual's perception of how other people view them and the ability to make choices which are different from those of the group. In this model, behaviour change depends on:

1. A high level of self-esteem.
2. Skills and strategies to resist peer group pressure.
3. An assessment of the pros and cons of change.
4. Motivation to conform.

HAM is based on the idea that people with a high level of self-esteem and a positive self-concept are likely to feel confident about themselves and as a result will have the ability to carry through a resolve to change their behaviour. Conversely, people with a low level of self-esteem are likely to believe that they have limited control over their fate and will be less likely to respond to a health promotion message, no matter how convinced they are by it at an intellectual level. The model also emphasises the need for facilitating factors, such as a supportive environment or the possession of personal skills, to support the translation of behavioural intention into action. The model illustrates that people's health behaviour is dependent, to a large extent, on the conditions of their lives, which for many are beyond their control. An implication of HAM is that a key part of many public health programmes may need to be focused on building up through community health education programmes self esteem, health literacy and health skills.



[228] Tones, K., Tilford, S., & Robinson, Y. (1990). Health Education .Effectiveness .and Efficiency. London: Chapman & Hall.
[229] Tones, B.K. and Tilford, S. (1994) *Health Education: Effectiveness, Efficiency and Equity,* 2nd edition. London: Chapman and Hall.

Conclusion

The above selective review of some of the key behavioural change theories and models illustrates that there is a great deal of understanding about the many factors at individual, group and society levels that impact on health decision making and behaviour. It is also clear that there is a need to place behavioural influence, the ultimate objective of many public health interventions at the heart of public health communication and behavioural change planning. In public health communication and marketing programmes we usually want to influence citizen's current awareness, attitudes, beliefs and behaviour so that some or all of these have been changed positively in line with policy objectives. Public health practitioners often want to take consumers on a behavioural journey from where they are now in terms of awareness, attitudes, beliefs and behaviour to a destination where some or all of these elements have been changed favourably according to designated policy objectives. Consequently, there is a need to articulate this behavioural journey clearly because it should enable practitioners to identify and define what they want to measure in their evaluation.

In planning intervention theories and models that can help frame thinking about how to influence behaviour. What is clear from the above brief review is that to increase the relevance of individual models of behaviour or theories of change it may be useful to use a 'mix and match' approach. When planning health promoting programmes, theories and models should have a central role in assisting the design and evaluation of the effective programmes[230],[231].

As this section of the paper has demonstrated, theory and models are key elements in planning any effective programme. When planning interventions practitioners and policy makers should always start by seeking out theory and models that can help frame thinking about how to influence behaviour. However, as this section of the paper has also demonstrated practitioners do not always start with this process and even if they do the evidence about the added value of applying theory is not unequivocal. One of the tentative conclusions that can be drawn from this review is that theories intended to modify individual level behaviours remain the most commonly applied. Policy and training interventions could be developed to broaden this focus to include ecological theory and models to guide research, intervention design and evaluation.

A further challenge to the use of many of the most quoted models and theories is the fact that many are predicated on a model of human cognition that emphasises a 'rational man' approach, which an increasing body of evidence (Which is discussed in section 7) indicates is not now thought to be sufficient for most health marketing and communication purposes, given increasing understanding about the many non-rational decisions and choices that are made by most people in relation to health. 'Rational man' models of behaviour work on the assumption that people seek to do things which will work in their best interests. Choices are assessed rationally in terms of costs and benefits, and then the decision which benefits the individual most is chosen. In some cases this works well, and the standard public health tools can be applied. However, as Halpern et al have detailed three key problems arise with this approach:

- Often the information available to individuals is not complete and they are therefore unable to reach a fully rational decision.

[230] Green J. Tones K. Health Promotion: Planning and Strategies. Second. London: Sage;2010.
[231] Brown D, McWilliam C, Ward-Griffin C. Client-centred empowering partnering in nursing. Journal of Advanced Nursing. 2006 Jan 1;53(2):160-8.

- Individuals rarely think in such a linear fashion, and people's wishes and aspirations are sometimes counter-intuitive.
- Individuals rarely come to decisions in isolation, and the context in which they operate needs to be taken into consideration. [232]

The above three points seem particularly pertinent to health issues. The next section of this paper considers attempts that have been made and research carried out to develop approaches to selecting which models to use in which situations and also the development of all encompassing models that seek to set out maps or approaches to understanding and applying models and theories. A number of such frameworks and taxonomies have been developed, for example the work of Abrahams and Mitchie.[233] Andrew Darnton[234] has produced some practical guidance for drawing on a wide range of behaviour change models to apply to any given health marketing challenge. He suggests starting with a literature search to identify relevant models and in particular the relevant factors within them. This review should include models which have been specifically developed for individual policy areas and target audiences. Where a model is needed to predict behaviour change, Darnton recommends that empirical data is used to show how well they predict behaviour change and what elements of the model are most successful in predicting this.

A further approach which is particularly useful when empirical data is not available is to revisit the audience insight for reported attitudes, barriers and drivers and use these to help identify relevant models. Reading the research in the light of several models helps ensure that the findings are not just taken at face value, and provides additional theoretical justification for their adoption. Similarly, research data helps isolate the elements of the models which are most relevant for inclusion in subsequent evaluation.[235]

It is possible and sometimes necessary when constructing behavioural frameworks for health communication and marketing, to draw on several models and theories, identifying those elements which are of most use in terms of their power to explain the behaviour which is being targeted. These will then form the building blocks around which communications and messaging can be designed and the campaign's success evaluated. This is the approach Darnton recommends to policymakers [236].

There will be occasions however, when existing behavioural theory is simply not available or appropriate for every circumstance. In this situation those responsible for constructing the behaviour change programme or communication programme will need to build a behavioural framework from scratch.

When building a bespoke model or theory to assist in the planning and delivery of a public health programme a number of factors which have been covered in this section of the paper will need to be considered. Drawing on the content above the last section of this paper sets out a number of new 'proto tools' to assist practitioners and policy makers review, assess and record which elements and influencing factors on behaviour may be of relevance when constructing such a model.

[232] Halpern, David and Bates, Clive, Mulgan, Geoff and Aldridge, Stephen with Bates, Greg and Heathfield, Adam, Personal Responsibility and Changing Behaviour: the state of knowledge and its implications for public policy, Prime Minister's Strategy Unit, Cabinet Office, February 2004
[233] Abraham, Charles and Michie, Susan, *A taxonomy of behaviour change techniques used in interventions* in Health Psychology, 2008
[234] Darnton 2008 op.cit.
[235] Department of Health Communication Guide 2010
[236] Darnton 2008 op.cit.

Proto Tool 4

30 Point Summary of Principles that Influence Behaviour

Recent findings from a variety of fields of study have all helped to expand and enhance our understanding of how and why people behave as they do and what can influence them to either maintain positive social behaviour or, change undesirable social behaviour. This learning gives us a powerful set of principles, which can be used to help design social change interventions.

What we now know is that many of our choices and the decisions we make that influence our behaviour, are not the result of active decision making, decisions and choices are often influenced by unconscious and automatic thinking. These 'decisions' are influenced by our social contexts, emotional engagement, social influence and environmental prompts, and also by factors such as timing, and our physiological state. However, we are capable of making rational choices. It is well known that when people have a chance to actively consider a problem or, are engaged in thinking through the best course of action, they make better decisions. Such approaches can also have a significant impact on how people behave and the choices they make in the future.

The following set of principles summarise much of what we currently know about influencing behaviour, drawn from fields of study that include, but are not limited to management, psychology, policy development, economics, design, sociology, biology and communication studies. These principles are clustered under four headings. These clusters while helpful in terms of mapping the range of influences on behaviour need to be viewed with the understanding that there is a great deal of interaction between all these clusters and the individual principles that sit within them.

Potential Intervention Approach
External conditions for change
1 People prefer to be involved and engaged. Participatory involvement often creates bigger behavioural change effects. Wherever possible, involve, consult and engage people in the selection, design, delivery and evaluation of interventions.
2 Social relationships are key. Approval and social support have a strong and persistent influence on behaviour. Working with and through key influencers improves the impact of behaviour change programmes. Use the power of group norms and behaviour to inform and engage people in change, let them know that others are changing and use the power of group action. Significant people in a person's social network can be used to influence their behaviour. For example, working through grandparents can be a good way to influence the behaviour of grandchildren, and the whole family.
3 People influence and are influenced by their physical, social and economic environments. There is a limit to a person's capacity to change if their environment militates against this. It is often necessary to deliver programmes that tackle the underlying environmental, social and economic barriers to change as well as personal factors.

4 People can be helped to change by designing services, procedures and environments that encourage people to act in a way that does not involve complex decision making. Design services and environments that encourage behaviours by removing the need for complex choices, for example making only low or non-alcoholic drinks available at social functions will encourage less people to get drunk. Removing unhealthy choices or other socially harmful options is often called 'choice editing'.

Internal conditions for change

5 A desire or at least an acceptance for change in the target audience will enhance efforts to bring about change. It is possible to enforce change that people do not support or actively oppose but there is a bigger chance of success if a target audience can be persuaded of the validity, necessity and plausibility of change.

6 Beliefs and values have a strong influence on how people behave. Programmes should start by understanding the target audience beliefs and attitudes and use these to inform the development of behaviour change, systems and environmental change, communication tactics and products that will assist change.

7 Behaviour is influenced by physiological and somatic state. If people are physically aroused this will often have an impact on their behaviour. Tiredness, physical arousal, anger, joy or a sense of relaxation will all have an impact on behaviour. People's somatic state, for example the shape of their body and how they perceive it will also have an impact on their behaviour. People who perceive themselves to
be fat often don't exercise because their weight impacts on their enjoyment.

8 Genetics can have an influence on behaviour; For example, there are some differences in the way men and women as a population, if not individuals behave differently in specific situations. For example, many young men are aggressive because they have high levels of testosterone.

9 People are often motivated to do the 'right thing' for the community as well as themselves and their families. Interventions that appeal to people's sense of being good, for example, fairness, justice and community togetherness can be powerful. Programmes that stress that the behaviour is one that is a norm in the community and one that is valued by others also tend to be more successful.

10 People's perception of their own ability to change can either enhance or detract from attempts to change. Programmes can be developed that focus on providing support that will build people's confidence and knowledge and skills. For example, teaching people how to recycle in a hands on way can increase both their understanding and confidence about recycling behaviour.

11 People often use mental short cuts and trial-and-error approaches to make decisions, rather than 'rational' decision making. An understanding of these short cuts or 'heuristics' should be used to develop interventions. For example, if people explain their view of the causes of unemployment as being due to new people moving into their area and taking all the jobs, it is possible with this insight to develop and suggest to them new heuristics such as, new people who move in take some jobs but they also spend money and so create more jobs.

Barriers to change
12 Habit is a key barrier in many change processes. People can be locked into patterns of behaviour and need practical help to break free or 'unfreeze' current behaviour. Programmes that provide practical support to change, are easy to access and those that require small first steps, tend to be more effective. Sometimes it may be necessary to 'unfreeze' long established behaviour by confronting the problem in a direct and robust manner.
13 Change is more likely if an undesired behaviour is not part of an individual's coping strategy. Avoid 'telling people off' for 'bad' behaviour if they are using it to cope with life. Demonstrate an understanding of the reasons for their behaviour and offer realistic and attractive alternatives that give practical support to change.
14 People's perception of their vulnerability to a risk and its severity is key to understanding behaviour and developing effective interventions. Programme developers should focus on understanding people's perceptions and how they view the risks associated with the behaviour that is to be targeted. It is also necessary to frame risks in ways that people can understand and are meaningful to them. The way that information is framed can have a big impact on behaviour. As an example people are more likely to decide to have an operation if they are told there is a 90% chance of success as opposed to being told that 10% of people die who have the operation.
15 People's perception of the effectiveness of the recommended behavioural change is a key factor in decisions to act. This means that we need to set out in terms that people value the effectiveness and benefits of the change that is being promoted.
16 People are over optimistic. Most people tend to believe that something good will happen or that possible negative consequences of actions or situations will not happen to them. People tend to overestimate their chances of being fortunate. This means that we need to communicate in terms that people can understand the probabilities of both negative and positive consequences of social behaviour.
17 Many people are bad at computation and risk assessment. Many of us do not understand numbers, risk ratios, odds or even percentages. Programme planners should always test the use and understanding of numerical and risk based messages before using them. It is best to convey risks and factual numerical information in ways that the target audience can both understand and find compelling. For example, the number of Olympic sized swimming pools full of water that can be saved by fitting a low volume flush toilet is more understandable than a numeric number of gallons.
Triggers to change
18 Change is more likely if the actions that have to be taken are easy, specific, simple and clear. Keep interventions specific and promote them in a way that the target audience views as relevant and appealing. For example, rather than general appeals to promote civic engagement it is better to work to bring about specific behavioural change in areas such as the number of people who sign up to do voluntary work for a specific charity or NGO.
19 Making the first step to change 'easy' helps engage people in the change process. Making the first step to change easy encourages more people to start a behaviour because the initial commitment is small and in so doing reduces the inbuilt status quo bias that many people have. People also like to be consistent, once they have started on a change path, with a small step they are more likely to continue with bigger changes. For example, asking people to donate

a very small amount will increase the chance that they will donate more the next time they are asked to do so.

20 People can be taught critical thinking and appraisal skills that can help them take more control over their behaviour and resist media, social and environmental influences. Active consideration of a change issue often leads to more permanent change. If people have a chance to explore and consider issues, this often helps them both reconsider attitudes and beliefs. This can help them change their behaviour or maintain a positive behaviour. Critical thinking skills once taught also begin to have an impact in many other areas of a person's life beyond the original focus of a programme and so can have many beneficial spin off effects in terms of promoting social good.

21 Behavioural experiences can influence beliefs and values. Programmes that move people to experiencing a behaviour as quickly as possible for example, giving them a chance to try the thing that is being promoted work best. It is not always necessary to rely on shifting attitude first. Behaving differently often leads to a shift in attitude. For example, providing a financial reward to recycle in the short term can increase recycling behaviour even when the incentive is removed.

22 The more beneficial or rewarding an experience, the more likely it is to be repeated. Maintaining positive behaviour can be assisted by reinforcement. Behavioural interventions should seek to reward desired behaviours and when appropriate penalise inappropriate behaviour. Interventions should also seek to support positive behaviour by maintaining a relationship with people which affirms their new behaviour and encourages them to build on it.

23 Change in behaviour is usually a process not an event and often entails several attempts before success. When delivering intervention programmes there is a need to be persistent, sustain interventions over time and offer multiple paths to success. It is also important to design in the possibility of multiple attempts to change and support for every attempted change.

24 People are loss averse. We will put more effort into retaining what we have than acquiring new assets or benefits. Therefore it is important to stress potential losses associated with the behaviour as well as the positive gains that can be accrued from change. Many people are often more concerned with short-term gains and costs, and tend to place less value on rewards or costs that might happen in the future. Programmes should emphasise short-term as well as long-term benefits and seek to reduce short-term costs. For example, when seeking to encourage young people not to get sun burnt emphasising immediate damage to their appearance as well as the longer term risk of skin cancer can be an effective strategy.

25 People perceive themselves to be and wish to appear to be consistent in their attitudes, beliefs and actions. This preference for consistency can be used to help people change. For example, if we ask people to make a public declaration to do something they are more likely to do it. People like to be consistent and when they have made a public commitment or pledge to act in a certain way, this pledge helps them to stick with the thing they have committed to, for example, getting someone to write down their next appointment on a card rather than doing it for them is a way to increase the likelihood that they will attend. People are also influenced by people that they like and can relate to. Liking is a key factor in how influential someone is on another person's behaviour. Liking is related to a sense of commonality with a person, a sense of being appreciated and listened to, and the exchange of compliments. Spokes person's, front line staff and representatives can be trained to develop their ability to foster good relationships with target audiences by demonstrating these characteristics.

26 People are influenced by authority figures. We are influenced by people that we perceive have legitimate authority by virtue of their status, position and/or physical characteristics. When using authority figures it is also important to test that they are perceived as having this status by the specific target audience of a programme.

27 People will usually change behaviour if they value what is being offered or in the case of a negative penalty that the penalty has meaning and significant consequences for them. Offers and penalties need to be presented in a way that people find meaningful and understandable. They should also be proportionate and seen to be fair. Rewards also need to be seen as desirable and do not necessarily have to have a large monetary value. For example, giving people who attend a cardiac rehabilitation service a different colour badge or pin as they graduate each stage of a class can act as a powerful incentive.
28 Communications and media including social media can have a powerful effect on people's attitudes, beliefs and consequently behaviour. However, this effect is not only confined to information transmission. The real impact of mass and social media on people is often more subtle. Media can build up impressions of relationships between issues, set the agenda for public debate and create emotional responses as well as transmit information.
29 People often exhibit decision and choice fatigue, and prefer not to have to act or make large numbers of complex decisions. Interventions can be designed that make the 'good' choice the easy and desired choice. For example, having a system that automatically enrols you into a social beneficial scheme rather than having to make an active choice to do so will increase the number of people who enter the scheme.
30 Feedback is a powerful way to assist people to change. Feedback is a special type of incentive and reward. It can be used to encourage people and provide them with additional help, guidance and support. Feedback in verbal, written or via direct physical instruction helps to sustain change. For example, using check lists, diaries and review meetings are all ways of both recording actions and providing a record that can be used to structure feedback and decide how future progress can be achieved.

Proto Tool 5

Key Influencing Factors Check List

Based on the most frequently utilised behavioural models and theories for public health communications and the preceding papers included in this section of the paper, the following proto tool suggests an analysis of factors that often influence human behaviour as the starting point for understanding how a health behaviour might be influenced by communication and marketing programmes. This tool sets out many of the key factors that should be considered when designing a health communication or behaviour change programme.

Influencing Factor	SUMMARY	Relevance to the Selected Intervention
Understanding	Investigate what the audience understand about the behaviour and what do they not understand. How is this understanding demonstrated?	
Conscious and Unconscious Decision Making	Analyse how the target audience makes decisions in respect of the behaviour. Are choices the result of unconscious rapid cognition or more considered choices?	
Intention	To make a successful behaviour change an individual must form a strong positive intention or make a commitment to performing the behaviour.	
Motivation	How motivated are the target audiences and what is the source and nature of their motivation.	
Heuristics and biases	What psychological biases, beliefs and heuristics scripts are influencing the target group in relation to the behaviours to be influenced?	

Environmental Barriers and Enabling Factors	Identify perceived and actual barriers or enabling factors in the environment affecting the target behaviour.	
Skills	An individual will need to possess the necessary skills to carry out the behaviour. Identify the specific skills needed and how prevalent they are in the target population.	
Attitudes	A positive attitude towards the behaviour change, particularly a belief that the advantage of making the change will outweigh the disadvantages, is an important step on the way to behaviour change.	
Social Norms and Customs	The influences of support groups, as well as wider social influences in promoting behaviour change are important for programme planning and evaluation. Understanding the perceived attitudes of friends, family and 'society' will also be important.	
Social Networks and Support	Identify social support networks, social capital and social assets that are available to prompt or maintain targeted behaviours and attitudes.	
Self-image	Assess if the change being promoted is consistent with an individual's self-perception and self image.	
Emotion	An individual's reaction to performing the behaviour change needs to be more positive than negative, so perceived emotion before performing the change and actual emotion once trialling it are good indicators of likelihood to continue with the behaviour change.	

Agency and Self-efficacy	An individual's belief that they are able to make and sustain the behaviour change. Assess the extent of self efficacy in relation to the target behaviour.	
Habit	Identify what habitual patterns exist amongst target audiences and what triggers and maintains them. Identify potential break or change points.	
Physiological State	Identify what somatic, hormonal, or genetic factors including age and gender impact on the behavioural issue.	
The Public Agenda	Identify what issues in the public discourse space and media are influencing or could influence attitudes beliefs and behaviour.	
Value / Exchange	Assess what value the target audience place on an existing pattern of behaviour and what level of value would need to be offered and in what form to produce a change.	

Towards Developing an Integrated Theoretical Framework to Assist Planning and Delivery

Introduction:

As described in the previous section there are a large number of behavioural theories and models that can be used to inform the design and evaluation of effective and efficient pandemic communication and behavioural influencing strategies. There is clearly a strong case for the application of theory in the development of interventions to change behaviour as stated in the MRC review of complex interventions states : [237]

> The rationale for a complex intervention, i.e. what changes are expected, and how change is to be achieved, may not be clear at the outset. If so, a vitally important early task is to develop a theoretical understanding of the likely process of change, by drawing on existing evidence and theory, supplemented if necessary by new primary research, for example interviews with 'stakeholders', i.e. those targeted by the intervention, or involved in its development or delivery. This should be done whether you are developing the intervention you are planning to evaluate, or evaluating an intervention that has already been developed and/or implemented.

As stated in the previous section there may be lots of competing or partly overlapping theories, that can be used and as Noar and Zimmerman make clear the use of many models to increase understanding is a useful approach [238] however selecting the most appropriate theory and models or elements of them will require the input of expertise from the relevant disciplines.[239] [240]. The review consideration and selection of an appropriate theoretical foundation for a pandemic communication and behavioural intervention is then a matter of some importance for a least three reasons. As Michie et al [241] states:

> "There are three main reasons for advocating the use of theory in designing interventions.
>
> First, interventions are likely to be more effective if they target causal determinants of behaviour and behaviour change; this requires understanding these causal determinants, i.e. theoretical mechanisms of change.
>
> Second, theory can be tested and developed by evaluations of interventions only if those interventions and evaluations are theoretically informed.

[237] Medical Research Council (MRC) Developing and evaluating complex interventions: new guidance. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M. www.mrc.ac.uk/complexinterventionsguidance. 2007
[238] Noar SM, Zimmerman RS. Health behaviour theory and cumulative knowledge regarding health behaviours: are we moving in the right direction? *Health Education Research* 2005;20(3):275-90.
[239] Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A. Making psychological theory useful for implementing evidence based practice: a consensus approach. *Quality and Safety in Healthcare* 2005;14:26-33.
[240] Albarracin D, Gillette JC, Earl AN, Durantini MR, Moon-Ho H. A test of major assumptions about behaviour change: a comprehensive look at the effects of passive and active HIV-prevention interventions since the beginning of the epidemic. *Psychological Bulletin* 2005;131(6):856-97.
[241] From Theory to Intervention: Mapping Theoretically Derived Behavioural Determinants to Behaviour Change Techniques Susan Michie* University College London, UK Marie Johnston and Jill Francis University of Aberdeen, UK Wendy Hardeman University of Cambridge, UK Martin Eccles Newcastle University, UK APPLIED PSYCHOLOGY: AN INTERNATIONAL REVIEW, 2008, 57 (4), 660–680 doi: 10.1111/j.1464-0597.2008.00341.x

Third, theory-based interventions facilitate an understanding of what works and thus are a basis for developing better theory across different contexts, populations, and behaviours".

However, there is often little guidance about how to develop theory-based interventions and theory appears frequently to be used in a non-systematic way or is simply used to inform rather than guide the development of programmes. There have however, been a few attempts to provide some guidance in this area.

One of the first attempts made by practitioners to provide a unifying framework of various behaviour change influences is the US National Institute of Mental Health, who convened a theorist's workshop to work through the key factors influencing behaviour and behaviour change.[242] Drawing on this, below are the key concepts which reoccur in the models and theories reviewed.

ELEMENT	SUMMARY
Intention	To make a successful behaviour change an individual must form a strong positive intention or make a commitment to performing the behaviour. Therefore some measure of intention should be included in the evaluation programme.
Environmental Constraints	Barriers in an individual's environment may make behaviour change difficult, so a measure of perceived and/or actual barriers should be a key part of any evaluation programme.
Skills	An individual will need to possess the necessary skills to carry out the behaviour, so a measure of perceived skill level combined with usage and awareness of any support and education tools is an important element in any evaluation programme.
Attitudes	A positive attitude towards the behaviour change, particularly a belief that the advantage of making the change will outweigh the disadvantages, is an important step on the way to behaviour change. Evaluating attitudes and monitoring changes are therefore important measures.

[242] Fishbein, M, Bandura, A, Triandis, HC, et al, Factors influencing behaviour and behaviour change: Final report, Theorists workshop, National Institute of Mental Health, 1992

Social Norms	The influences of an individual's immediate support group as well as wider social influences in promoting the behaviour change are an important indicator for evaluation. Measuring the perceived attitudes of friends, family and 'society' could act as a proxy indicator here.
Self-Image	The behaviour change needs to be consistent with an individual's self-image, so a way of capturing firstly self-image and matching this with perception of the behaviour change will be useful.
Emotion	An individual's reaction to performing the behaviour change needs to be more positive than negative, so perceived emotion before performing the change and actual emotion once trialling it are good indicators of likelihood to continue with the behaviour change.
Self-Efficacy	An individual's capabilities to perform the behaviour change in a range of circumstances and their belief in this are important in many of the models, so a measurement of perceived and actual capability is often key in evaluation.

This summary list seeks to concentrate the planners mind on the key elements that need to be considered when developing an intervention. The question of how these key elements can and should be applied was addressed in a review commissioned by the UK Government in 2008. The UK Social Research Unit (GSR) [243] commissioned a review to clarify the use of models of behaviour change for research analysts, with the intention of improving advice to policy makers seeking to influence behaviour related to social programmes and the evaluation of such programmes. The review was designed to:

- Provide an overview of relevant models and theories.
- Provide guidance on their uses and limits.

While the review started from the point of providing an introduction to behaviour change theory, it resulted in the development of practical guidance for analysts and policy makers and practitioners. The review made a clear distinction between models of behaviour and theories of change. Models of behaviour were defined as being primarily helpful in enhancing understanding about specific behaviours, by identifying the underlying factors which influence them. Theories of change show how behaviours change over time, and can be changed.

The report also makes it clear that these two bodies of theory are complementary, understanding both is necessary in order to develop effective approaches to behaviour

[243] GSR Behaviour Change Knowledge Review. Overview of Behaviour Change Models and their Uses. Briefing Note for Policy Makers. Darnton A. Centre for Sustainable Development, University of Westminster 2008.

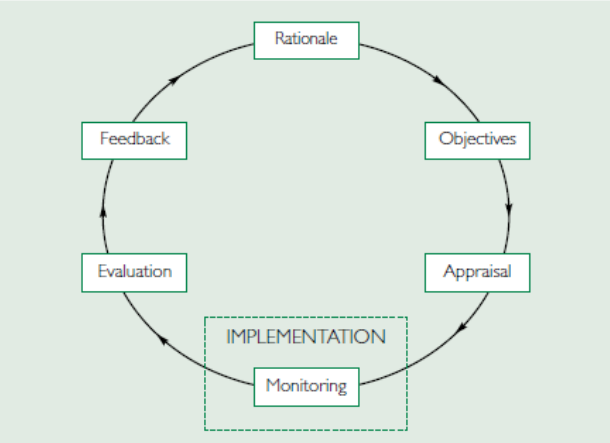
change. The report also sets out guidance that behavioural models should be regarded as concepts for helping to understand behaviours, rather than recipes for bringing about behaviour change and models should not be adopted uncritically rather they are starting points for analysis and testing.

The GSR report recommends that policy makers should adopt an approach to intervention development which embeds behavioural models in a process shaped by theories of change. The selection of relevant behavioural models can suggest the key factors to work on and theories of change suggest a developmental process should be adopted based on audience engagement, piloting, and on-going monitoring and adaptation. The report also makes it clear that there is no algorithm that can be applied to select models or theories and ultimately, a theory-based approach needs to be flexible to take account of different behavioural contexts and audience groups. This should also incorporate learning from practice, having identified what works in comparable interventions.

However, the report argues for effort to be put into underpinning and developing a theoretical framework, for all social policy interventions focused on influencing behaviour, as theoretical modelling is needed to develop clear and measurable objectives and outcomes.

In the GSR review Darnton recommends that empirical data is used to show how well they predict behaviour change and what elements of the model are most successful in predicting this. A further approach is recommended which is particularly useful when empirical data is not available. This is to revisit the audience insight for reported attitudes, barriers and drivers and use these to help identify relevant models. Reading the research in the light of several models helps ensure that the findings are not just taken at face value, and provides additional theoretical justification for their adoption. Similarly, research data helps isolate the elements of the models which are most relevant for inclusion in subsequent evaluation.

The review sets out nine principles in a logical sequence, but makes clear that they should not be regarded as discrete steps, with one being accomplished before moving on to the next. Instead the principles can be best understood as a staged but iterative process. Importantly in terms of policy coherence the cyclical nature of the Nine Principles is also in keeping with existing guidance on policy evaluation, such as the ROAMEF model in the Green Book [244] which demonstrates how research can support effective delivery throughout the policy cycle.



[244] HM Treasury. The Green Book. Appraisal and Evaluation in Central Government. London. TSO. 2011.

The GSR Nine Principles are:

1. **Identify the audience groups and the target behaviour.** If faced with a complex behaviour, break it down into its component behaviours and/or adopt a systems thinking approach.

2. **Identify relevant behavioural models** (use both individual- and societal level models). Draw up a shortlist of influencing factors.

3. **Select the key influencing factors**
use these to design objectives in a draft strategy for the intervention.

4. **Identify effective intervention techniques**
which have worked in the past on the influencing factors selected.

5. **Engage the target audience for the intervention** in order to understand the target behaviour and the factors influencing it from their perspective.

6. **Develop a prototype intervention** based on the learning from working with the actors. Cross-check this against appropriate policy frameworks and assessment tools. Pilot the intervention and monitor continuously.

8. **Evaluate** impacts and processes.

9. **Feedback** learning from the evaluation.

The Nine Principles resemble existing theory-based guidance for planning interventions, but aim to achieve a synthesis between the different approaches. The key difference between the Nine Principles and other approaches such as social marketing and Gardner and Stern's Principles (in Stern 2000)[245] is the building of behavioural models into the heart of the developing process. The Nine Principles can also be compared to the Intervention Mapping (IM) framework, which similarly centres on behavioural models, but which follows a more programmatic path to intervention development and implementation (Bartholomew et al 1998)[246]. The GSR review principles can then be used to locate theory at the heart of the intervention planning process.

Another useful framework for considering the selection and place of behaviour change theory is work by Abraham and Michie, who have developed a taxonomy of terms used in behaviour change interventions to create a standardised terminology and a meta model they term the 'Behaviour Change Wheel' that seeks to encapsulate sources of behavioural influence, a spectrum of intervention functions and a set of policy categories. From a review of techniques used in physical activity interventions, 26 behaviour change techniques were identified, 18 of which are taken from generic behaviour change theories.[247]

Mitchie and et al contend that there are three groups of behavioral change theories. Those that relate to motivation, those that relate to action and those that relate to organisational change. E.g.:

[245] Stern, P 2000. *Towards a Coherent Theory of Environmentally Significant Behaviour*. Journal of Social Issues 56 (3), 407-424.
[246] Bartholomew, K, G Parcel and G Kok 1998. *Intervention Mapping: A Process for Developing Theory and Evidence-Based Health Education Programs*. Health Education and Behavior 25, 545-563.
[247] Abraham, Charles and Michie, Susan, *A taxonomy of behaviour change techniques used in interventions* in Health Psychology, 2008

Motivational: Explains the behaviour of people who have not yet established intention, e.g. Theory of Planned Behaviour, Operant Learning Theory.

Action: Explains the behaviour of people who have identified a need to change, e.g. Control Theory/Self-regulation Theory.

Organisational: Explains 'institution' level change, e.g. Diffusion of Innovation Theory.

Mitchie et al[248] undertook a consensus study to develop an integrated model of behaviour change theory which involved an analysis of 33 theories and 128 constructs generated which were subsequently simplified into 12 domains of theoretical constructs.

1. Knowledge.
2. Skills.
3. Professional role and identity.
4. Beliefs about capabilities.
5. Beliefs about consequences.
6. Motivation and goals.
7. Memory, attention and decision processes.
8. Environmental context and resources.
9. Social influences.
10. Emotion.
11. Action plans.
12. Nature of the behaviour.

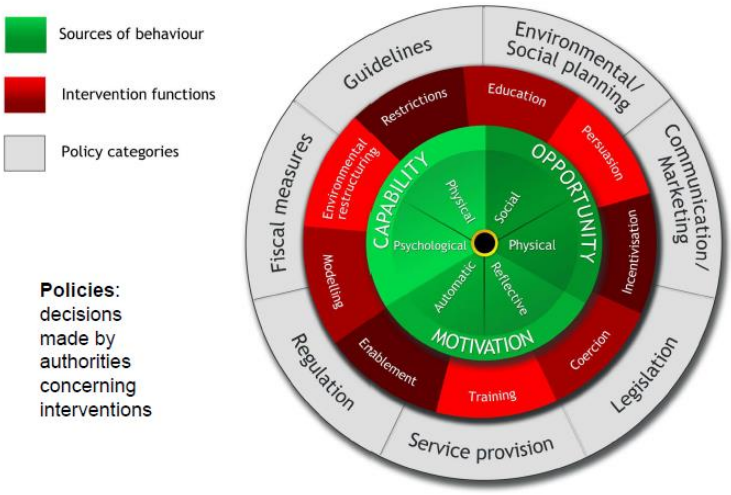
Mitchie et al have set out what they call the "COM-B system" which stands for: Capability, Motivation (Which is divided into reflective and automatic consideration) and Opportunity, all of which should be considered when developing a behavioural intervention.

Mitchie et al have gone on to develop a more sophisticated framework called the 'Behaviour Change Wheel' [249] based on previous analysis of theory and a trawl of 19 behaviour change planning and intervention frameworks, see figure 1:

[248] Mitchie S et al (2005) Making psychological theory useful for implementing evidence based practice: a consensus approach, Quality and Safety in Health Care, 14, 26-38.

[249] Michie S, Stralen M. West R. The behaviour change wheel: A new method for characterising and designing behaviour change interventions Implement Sci. 2011; 6: 42. Published online 2011 April 23. doi: 10.1186/1748-5908-6-42. PMCID: PMC3096582

Figure 1

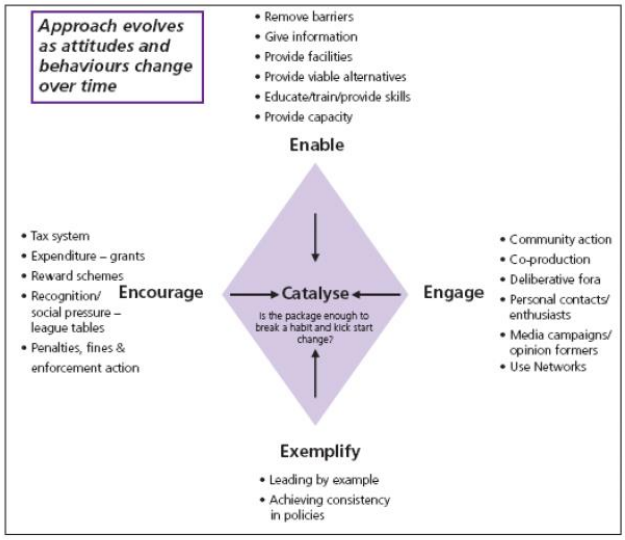


The 'Behaviour Change Wheel' has at its centre what Mitchie et al call the 'Sources of Behaviour', set out under the three COM-B headings of Motivation (Sources: Automatic and Reflective), Opportunity (Sources; Social and Physical) and Capability (Sources: Physical and Psychological). The 'Behaviour Change Wheel' makes a clear distinction between 'behavioural interventions' and 'policies' that enable or support those interventions. The next layer of the model sets out nine types of intervention activities that can be used to influence behaviour. These are: Education, Persuasion, Incentivisation, Coercion, Training, Enablement, Modelling, Environmental Restructuring and Restrictions. The final element of the model is the policy enabling outer ring that consists of six possible policy approaches to enable or support each, or combinations of the possible nine intervention types. The policy approaches are: Environmental/Social Planning, Communications/Marketing, Legislation, Service Provision, Regulation, Fiscal Measures and Guidelines.

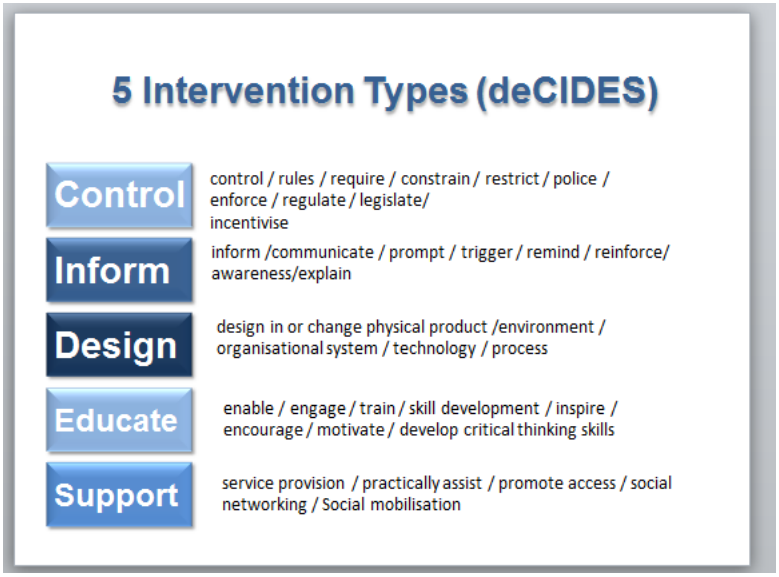
Mitchie et al agree with Darnton that when developing effective interventions it is necessary to start with a deep analysis of the target group and behaviour including a precise description of its determinants prior to model selection or development. The next step in any systematic process should be to consider the full range of possible interventions and policies before identifying specific behaviour change techniques and communication strategies to bring about change.

The 'Behaviour Change Wheel' is one of the more comprehensive attempts to date to synthesise a great deal of previous work on theory and behavioral change intervention modelling. Like other attempts to present a totalising model however there are obvious critical questions regarding the exact categorisation of elements and definitions of the concepts selected. The model also has a number of fairly obvious intervention and policy omissions such as design, community development etc. The conflation of types of decision making a (Automatic and Reflective) with influences of behaviour is also problematic. With regard to the focus of the E-Com project the out of date definition of marketing employed within the model is also a major weakness as it both conflates communication and marketing and categorises them as 'policy' whereas as explored in latter sections of this paper social marketing is conceded by most commentators to be an integral part of every stage of policy development, research, strategy formulation delivery and evaluation. However, the model like others in this section is a helpful conceptual tool, and like other models set out in this paper, research will be needed to establish how far the 'Behaviour Change Wheel' can lead to more efficient selection and design of effective interventions.

One useful advantage of the 'Behaviour Change Wheel' model is that it seeks to bring together behavioral influencing factors with potential forms of intervention. A number of other models have also been developed to set out models of intervention approaches. One of the most commonly quoted is the DEFRA 4 E's model of pro-environmental behaviour influence [250].



French et al [251] have also set out for the UK National Social Marketing centre what is known as the DECIDES model of five types of behavioural intervention clusters.



These and other models seek to add descriptive models of intervention options and operational delivery considerations to considerations of models of behavioural influence and processes of change.

[250] DEFRA A framework for pro environmental behaviour. DEFRA 2008. http://www.defra.gov.uk/publications/files/pb13574-behaviours-report-080110.pdf

[251] French J Blair Stevens C. McYet D Merritt R. Social Marketing and Public Health. Theory and Practice. Oxford University Press. 2010

Conclusion

This section of the paper has reviewed a small selection of approaches to the selection of theoretical models and the setting out of how behavioural theory and interventions can be conceptualised. An integrative approach seeks to recognise and value different theoretical disciplines and perspectives, each of which has potential to help explain and provide potential insight into what is happening and why and how key influences on behaviour can be used to influence how people act. To adopt an integrative approach rather than a single default theoretical perspective and apply this to all situations is clearly necessary to consider and integrate understanding from a wide range of academic and applied fields.

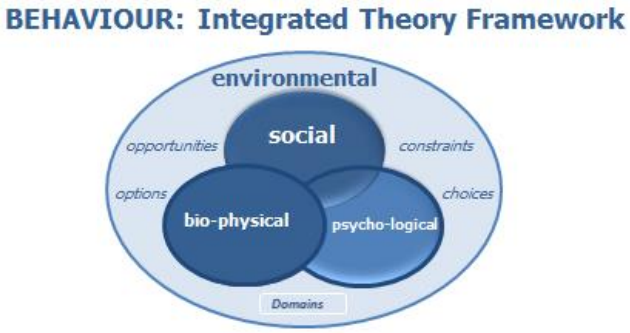
To assist the process of conceptualising the range of theories and key domains of influence the following two proto-tools have been developed, based on the key reference documents quoted in this and previous sections of the paper. It is intended that these proto-tools have been developed for testing in latter stages of the E-Com project to guide the selection and application of theory and models of behaviour change.

Proto Tool 6

Open Analysis Approach to Selecting Models and Theories of Behaviour Change

The following four domains of influence appear to be key when selecting theory and models of behaviour:

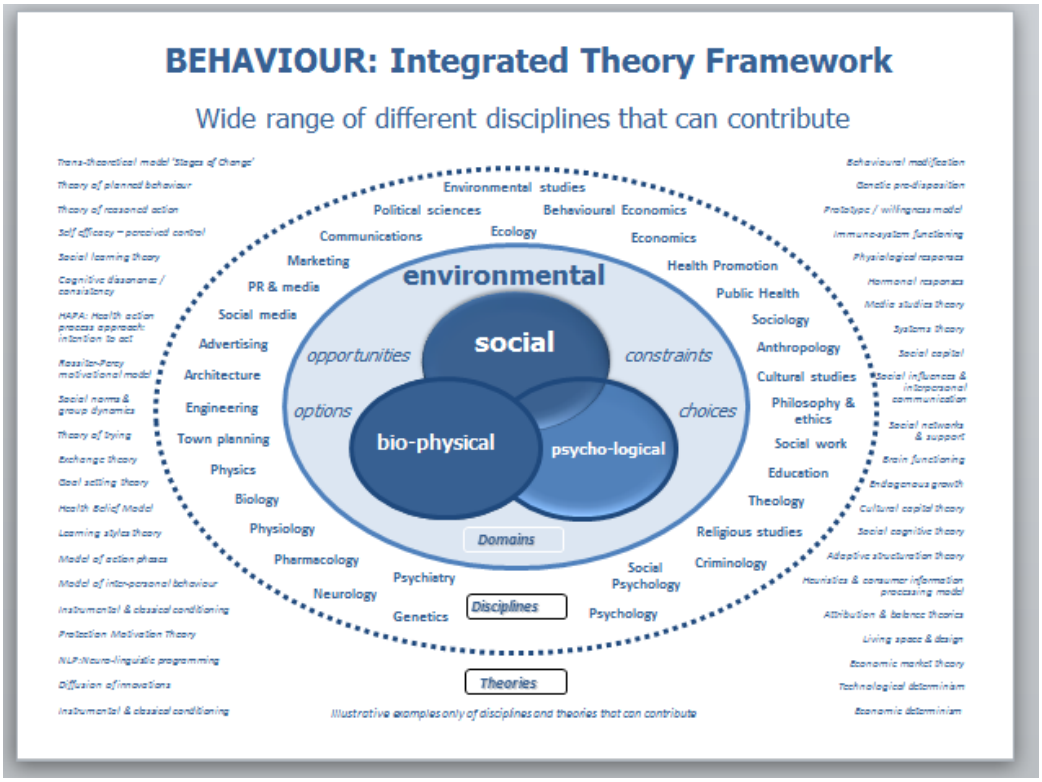
- **Bio-physical** e.g. Biology
- **Psychological** e.g. Psychology
- **Social** e.g. Sociology
- **Environmental and Economic** e.g. Environmental Studies and Economics



Step One:
Recognise the Multiple Influences on Behaviour

For each of these four domains there are a range of disciplines that inform or are grounded in that perspective. Each of these disciplines has their own range of theories and ideas about what influences behaviour and often each feeder discipline has a number of competing or antagonistic theories. The first step in the process is to accept the influences from these four domains and begin a review of potential influences on behaviour from this perspective. Using this frame of reference potential models and theories can be sought that inform understanding about the impact of each of these four domains on behaviour.

This first stage should be as unrestricted as possible; theory should be sought not just from each domain but also from fields of behavioral influence outside public health. Valuable models and lessons can be learnt from fields such as environmental behavioural influence, transport use, financial decision making and planning and from areas outside the immunisation and pandemic preparedness fields; for example for the fields of smoking, obesity and accident prevention.



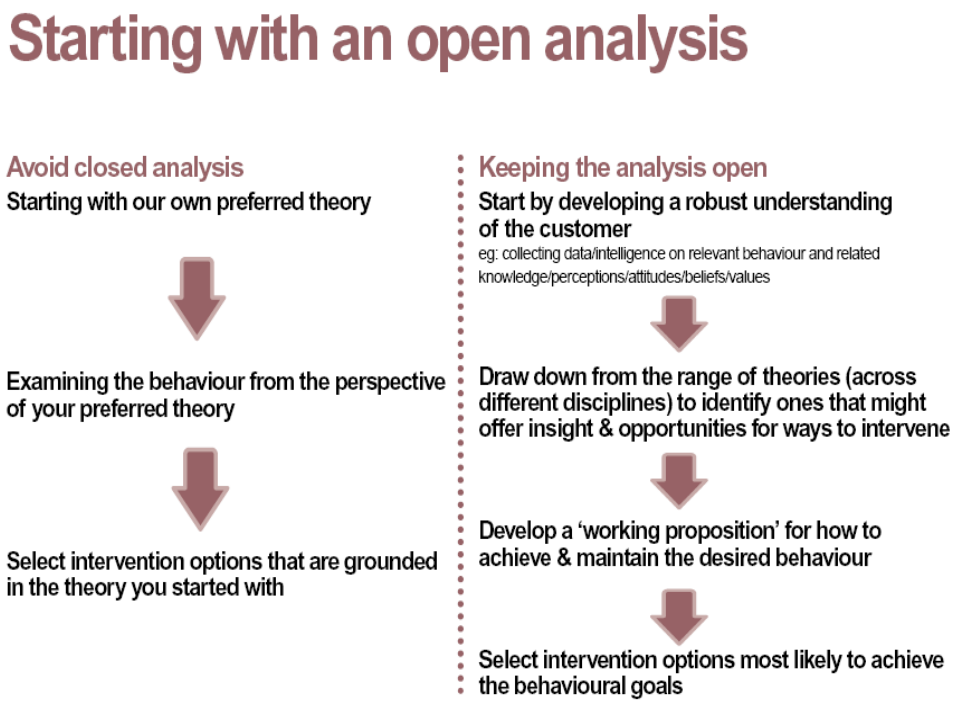
Step Two:
Assemble a Multi-Disciplinary Team

There is also a need to be pragmatic and recognise that it is impossible for practitioners to be expected to have detailed understanding of so many disciplines and theories and to conduct exhaustive reviews of theory prior to any strategy or action being delivered. One way to reduce the effort required and to increase the theoretical frame of reference that can be applied to understanding particular issues is the tactic of bringing together multi-disciplinary teams from different backgrounds. This approach will increase the range of theoretical models that will be applied in any given situation.

Each profession within the public sector has its own assumptions about how behaviour is best changed and how best it can be built into their policies, be it through information giving; education; regulation; service provision, or 'enabling' measures. Some professions assume that the public make rational choices based on evidence, while others recognize that users are often troubled, or emotional. For example trading standards works through regulation and enforcement, while planners may try to 'design in' behaviour change (e.g. building flats without car parking spaces to discourage car use), while children's services may put more emphasis on talking, interaction, support and advice. Recognising and understanding these different approaches is a first step to making good choices about which approach to use in each situation.

Step Three:
Apply an Open Analysis rather than a start from Fixed Ideas or a Fixed Theory

As discussed above and recommended in the 2008 GSR review if theory is to be used to inform practice it is necessary first to start by trying to get a clear understanding of 'what' behaviour is occurring, and what different people know, think and feel about it. Before then going on to 'pull-down' theory to consider what might help inform or develop insight into why people are adopting a behaviour and the potential insights that might provide ways for effectively intervening. In this way a focus on the behaviour drives the development of a theoretical perspective rather than the other way round.



The final stages of step three should involve the development of 'working propositions' for how to achieve and or maintain the desired behaviour that is being focused on. These propositions will be based on existing and possible newly devised models of behaviour drawn from the literature but also form what is understood about the target audience and what influences the behaviour in question. Interventions can then be developed based on these propositions and tested in pilots and field trials to see if they deliver the anticipated impact on behaviour.

STRATEGIC SOCIAL MARKETING

Proto Tool 7

Principles for Designing Interventions Informed by Theory and Models of Behaviour Change

(Base on the an amalgamation of GSR review [252] Abraham & Mitchie [253] recommendations and STELA planning model[254])

Task	Responsible Agent	Time frame	State of Completion
Identify audience/s for the intervention.			
Identify and quantify list of SMART objectives related to behaviour, attitude, beliefs, and knowledge for each audience.			
Identify relevant theory and models used before with these groups or behaviours.			
Identify key behavioural influencing factors.			
Identify further models and theory that have relevance to factors affecting the behaviours, social or economic factors being targeted.			
Identify from literature review potential intervention approaches theory and models.			
Engage target audience as active agents in agreeing the behavioural influences on the target behaviour.			
Set out and agree with target audience, and stakeholders the theoretical models, theories and or a bespoke model that will guide the intervention.			

[252] Darnton A. (2008), GSR Behaviour Change Knowledge Review. Reference Report: An overview of behaviour change models and their uses, HMT Publishing Unit, London.
[253] Abraham, C and Michie S. *A taxonomy of behaviour change techniques used in interventions* in Health Psychology, 2008
[254] French J STELA planning model for social marketing programmes. 2010 available at http://stelamodel.com/

Engage partners and stakeholders as active agents in the design, delivery and evaluation of the intervention using community engagement theory and models.			
Develop a prototype intervention based on analysis and theory using a published or bespoke design and planning model.			
Deliver and evaluate prototype intervention paying particular attention to the utility and predictive qualities of the behavioural theory and model used.			
Adapt and refine prototype and develop full implementation plan based on findings of the pilot together with stakeholder and target audience support.			
Develop full evaluation strategy to include a review of the utility of the theory and models used to underpin the intervention.			

"Information does not necessarily lead to increased awareness, and increased awareness does not necessarily lead to action. Information provision, whether through advertisements, leaflets or labelling, must be backed up by other approaches."[255]

New Understanding from Behavioural Research, Psychology and Economics

Introduction

This section of the paper reviews new developments in theory and practice related to behaviour change coming from the field of behavioural economics. The section gives a general introduction to the scope of behavioural economics and sets out some of the tactical and strategic implications for public health programmes and how these are being applied.

The limitations of the traditional or neo-classical economic theory and its impact of behavioural change theory and practice

Policy makers and many public health leaders have tended to consider human behaviour to be modelled on many of the theories of traditional or neo-classical economics. These theories assumed that humans are rational beings isolated from one another who tend to behave logically to financial and social incentives and disincentives, the term 'Rational Man' approach is often used as shorthand for this theory.

Neo-classical economic analysis models the way in which people are expected to behave in order to predict/assess the impact of a given intervention on the desired outcome. The theory postulates that people undertake a form of 'cost benefit analysis' weighing up of the costs and benefits (or pain and pleasure?) of a number of choices and then selecting the option that will maximise the net utility. Poor choices according to these theories often spring from lack of relevant or important information. Classical economists often talk in this regard of 'Information Asymmetry' distorting markets and rational decision making. In terms of pandemic health promotion programmes this conception of human motivation gets translated into the search for the best ways to communicate risk and prevention strategies that maximise personal benefits and benefits to a persons close family and friends.

In common with this standard approach to economic theory and many of the older social psychological models (reviewed in section five of this paper) work on the assumption that human behaviour is intentional, considered and consistent with our beliefs and attitudes. These assumptions often result in linear views of behaviour, such as those in which beliefs

[255] Jackson. Motivating Sustainable Consumption - a review of evidence on consumer behaviour and behavioural change. http://www.sd-research.org.uk/documents/MotivatingSCfinal.pdf, , 2005

lead to attitudes, which inform intentions, which result in behaviours, for example social learning theory. This way of thinking often reinforces information dominated interventions, which aim to change attitudes, on the assumption that attitude change will lead to a change in behaviour (see section four of this paper for a more detailed review of the strengths and limitations of such approaches). It is the case however, that in many public health challenges this assumption has been shown not to be the case; for example most people know that smoking is bad for them but they still do it.

Traditional economic theory also does not make any value judgments about the validity of people's preferences; it is not interested in trying to explain where people's preferences come from (something which psychologists and sociologists are keenly interested in). Therefore it does not take into account the way we interact with others i.e. the direct influence of others behaviour, reciprocation, and the emotions that others provoke in us, such as envy.

Once people have a set of preferences, these are assumed to be relatively fixed over time, until people are given an incentive, then people will make a choice that maximises their utility given their resources. In this way, financial rewards or incentives are always expected to encourage behaviour, while financial fines or sanctions are expected to discourage certain behaviours. Examples of incentives and sanctions being used in this way include such public health interventions as speeding fines for driving too fast. Although standard economic theory is good at explaining short-term decision-making, it is often less good at explaining longer-term changes in preferences and it is not good analysing why certain policies don't work.

The rational man approach that underpins neo-classical economic theory has a key weakness in that it ignores the complexities or imperfections of human nature and decision making. People do not always have access to a full range of relevant information, and even if they do, people are not always capable of systematically processing this information in order to make the most rational choice. People are also influenced by other factors such as others behaviour, emotions and habit. The risk of relying on an approach that does not take into account these complexities is that it may lead to unrealistic analysis of what a policy intervention should be and is capable of.

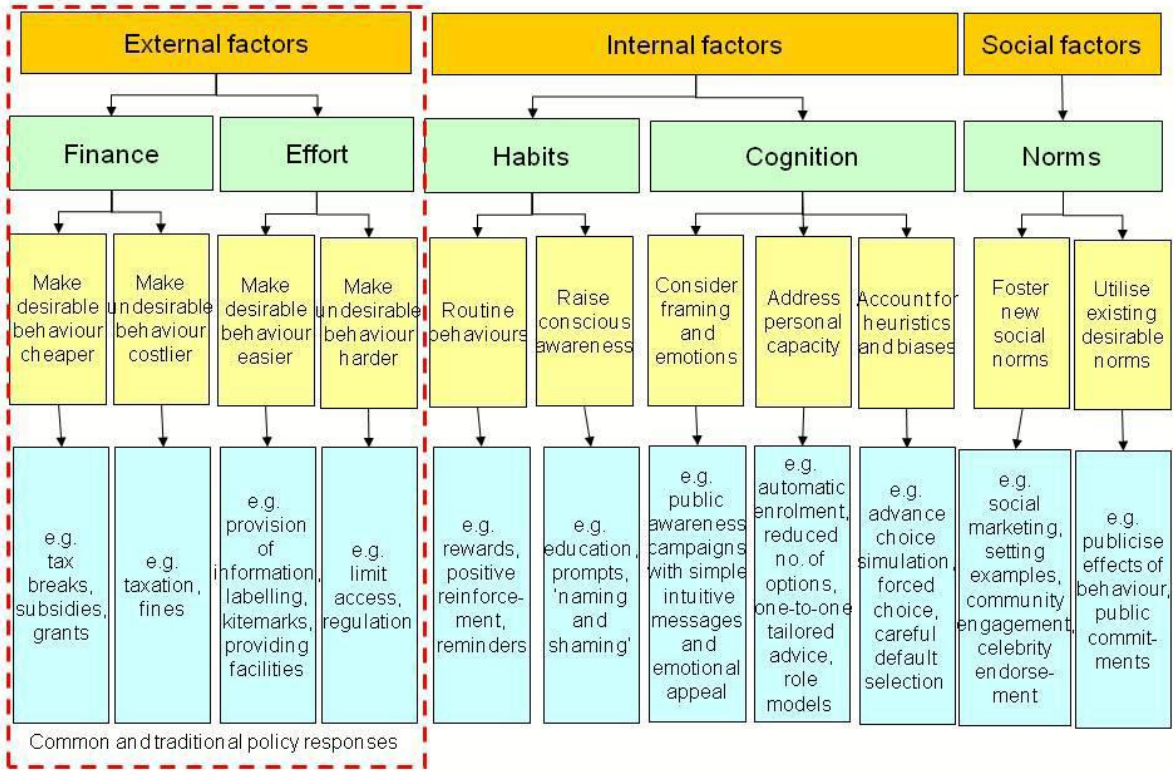
Traditionally, the focus for many public health policies has been to change behaviour using external drivers such as information provision financial incentives (e.g. taxes, subsidies, and conditional cash payments; for example provision of child benefits if a child receives the recommended vaccination schedule) and regulation (e.g. prohibiting certain actions, setting standards for example only allowing vaccinated children to start school). However, incorporating a wider understanding of behaviour (both individual and societal) recognises the importance of intra and inter-personal drivers and the points of influence. Traditional external approaches will always be key policy tools but the effectiveness of policy interventions would also appear to be dependent on understanding and reflecting what is known about internal processes of decision making and action, much of which lies outside the rational domain.

Recent developments in economic and behavioral theory are now shedding new light on how many decisions are made in non-rational ways and how this new understanding can be used to build more effective and efficient programmes. These developments highlight the need to pay much more attention to non-rational decision making processes (e.g. desires, habits, emotions and unconscious mental short cuts,) and a much wider range of external

social influencers (e.g. interpersonal relationships, social norms and social systems) on shaping behaviour. Figure 1 (from the Social Market Foundation) provides a useful overview

of such an expanded spectrum of behavioural factors with an indicative range of options and tools associated with different types.

Figure 1: Factors in Human Behaviour



Source: From Prendergast et al, *Creatures of Habit*, SMF

This model is helpful in that it illustrates that human behaviour is influenced by external, internal and social factors all of which can involve both rational but also other forms of non-rational action such as habit based behaviours.

Whilst the rational conceptualisation of human motivation has always been viewed as an over simplification even by economists, but it has over the last fifteen or so years been subject to increasing challenges due to a rapid growth in evidence and experimental studies from a wide range of social and behavioural sciences. Notably from the new field of study entitled 'behavioural economics' which draws on insights from economic, sociology, psychology, neuroscience and other behavioural sciences such as evolutionary biology.

The Nature and Scope of Behavioural Economics

As stated above the traditional model of rational decision-making inherent in neo-classic economic theory has underpinned much public health work. As also stated above, two key assumptions about human behaviour underpin standard economic analysis, (also referred to as the 'rational man' approach) [256]

i. People seek to maximise their own utility (or in other words seek to further their own interest).

ii. People act rationally (People are fully capable of accessing and systematically processing the range of information available to them and in weighing up this information are able to make the best choice from the many possible choices available to them).

Behavioural economics has emerged as a challenge to the neo-classical economic theory and its assumption of rationality. Behavioural economics accepts that people are irrational but believes that this irrationality can be understood and predicted and therefore can be used in both economic and social change programmes. Behavioural Economics has been defined as: *'The combination of psychology and economics that investigates what happens in markets in which some agents display human limitations and complications*.'[257]

Behavioural economics takes issue with the standard neoclassical economic model based on rational man theory by using insights form experimentation and observation to build new explanations about how human behaviour is in fact very different from this model. These additions to the neo-classical model include, but are not limited to the assertions that:

1. People, exhibit bounded rationality, they are not always rational.
2. People often make systematic mistakes.
3. People have limited willpower which gets rapidly used up if continuously challenged.
4. People avoid making complicated decisions.
5. People often make choices that are inconsistent over time.
6. People prefer fairness and are willing to pay for it.
7. People are influenced by how choices are 'Framed'.
8. People tend to be overconfident and over optimistic.
9. People are risk averse.

Behavioural economics recognises that people are inconsistent flawed decision makers and that people make decisions based on 'unreliable facts', such as previous personal experience and beliefs about the trustworthiness of sources of information.

Interestingly behavioural economics theory has been underpinned by the two people who are not economists who have won Nobel prizes for economics. Based on his earlier work Herbert Simon (political scientist) put forward the concept of 'Bounded Rationality,' [258] [259] arguing that rational thought alone did not explain human decision-making. Then, Daniel Kahneman, with Amos Tversky (Psychologists) published "Prospect Theory [260] An "Analysis of Decision Under Risk". This was a key paper on how people handle decisions about

[256] Presentation by John Guest (University of Coventry) at GES Seminar on Behavioural Economics May 2007. DEFRA.
[257] Thaler, R (2000) 'Behavioural Economics' International Encyclopaedia of the Social and Behavioural Sciences

[258] 1957. Models of Man. John Wiley. Presents mathematical models of human behaviour
[259] 1979. Models of Thought, Vols. 1 and 2. Yale University Press. His papers on human information-processing and problem-solving
[260] Kahneman, D l; Ed Diener (2003). Well-being: the foundations of hedonic psychology Russell Sage Foundation

uncertain rewards and risks. The authors argued that the ways in which alternatives are *framed*, not simply their relative value, heavily influence the decisions people make. This was a seminal paper in behavioural economics that set out a clear challenge to the neoclassical models view that people simply and logically want to maximise personal benefit. A good example with direct bearing on pandemic event management of this 'framing effect' is illustrated by the following example. In a 1981 Science paper, "The Framing of Decisions and the Psychology of Choice," Tversky and Kahneman presented the following example:

*"Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease which is expected to **kill 600 people**. Two alternative programmes to combat the disease have been proposed.*

> ***"Choose Programme A**, and a projected 200 people will be saved.*
>
> ***Choose Programme B**, and there is a one-third probability that 600 people will be saved, and a two-thirds probability that no one will be saved.*

The authors reported that 72% of respondents chose Programme A, although the actual outcomes of the two programmes are identical. Most subjects were risk averse, preferring the certain saving of 200 lives. The researchers then restated the problem: this time, with Programme C:

> ***Choose Programme C** "400 people will die," whereas with*
>
> ***Programme D**, "there is a one-third probability that no one will die, and a two-thirds probability that 600 people will die."*
>
> *This time, 78% chose Program D—again, despite identical outcomes. Respondents now preferred the risk-taking option. The difference was simply that the first problem phrased its options in terms of **lives saved**, and the second one in terms of lives **lost.** People are more willing, apparently, to take risks to prevent lives being "lost" than to "save" lives*. [261]

In 2000 Stanovich & West added to the debate with their description of two distinct systems of cognition that influence decision making based on emerging experimental studies from the world of social psychology and empirical studies from the world of brain imaging. They describe these systems as**:** Systems One and Systems Two[262].

System One is more intuitive, reactive, quick and holistic. In **System One** thinking, we rely on a number of heuristics (Cognitive manoeuvres and short cuts), situational prompts, readily associated ideas, and vivid memories to arrive fast and confident decisions.

'System 1' thinking is particularly helpful in routine situations when time is short and immediate action is necessary. While System 1 is functioning, another powerful system is also at work, that is, unless people specifically shut it down by for example drinking a lot of alcohol. System 2 is the more reflective thinking system that people used for making judgments when they find themselves in unfamiliar or complex situations and also have

[261] http://en.wikipedia.org/wiki/Behavioral economics

[262] Stanovich K & West R.. Individual differences in reasoning: Implications for the rationality debate? *Behavioural And Brain Sciences* 23, 645–726. 2000

more time to weigh options cost and benefits of a particular choice of course of action. It allows us to process abstract concepts, to deliberate, to plan ahead, to consider options carefully, to review and revise our work in the light of relevant guidelines or standards or rules of procedure.

However, Systems 2 thinking is exhausting and difficult and people tend not to use this form of thinking very much. System 2 is described by Kahneman as 'Our lazy controller'. System 2 decisions are more deliberative, however they are still influenced by heuristics that impact on system 1. System 2 however also relies on well-articulated reasons and more fully developed evidence. It uses reasoning based on what people have learned through analysis, evaluation, explanation, and self-correction. This is the system which people rely on to think carefully through complex, novel, high-stakes, and highly integrative problems.

However, for most of the time according to Stanovich & West we prefer to operate in System 1 mode. This model has been expanded by Kahneman [263] in his popular book 'Thinking Fast and Thinking Slow', in which he rehearses not only the basic findings in relation to Prospect Theory (The importance of relevant advantage) but also how these two systems operate, how they influence each other and how they can be influenced. Kahneman gives many examples backed by research studies that illustrate how factors such as cognitive ease, social norms, anchoring, availability, emotion, the impact of recent events and framing all impact on decision making.

A great deal of other work has been undertaken by behavioural psychologists, brain scientists and biologists in recent years that has expanded our understanding about what influences non-rational behaviour. Major works in this area are those by Ariely [264], Ciladidi [265] Goldstein et al [266] and Brafman and Brafman [267]. For example Ciladidi sets out a list of six principles of persuasion that are based on emergent understanding about influences on non-rational choice or System One thinking. These are:

1. **Liking:** We are influenced by people we feel we can relate to.
2. **Authority:** We are more open to being influenced by a person who can demonstrate or we perceive to have impressive credentials, experience and knowledge.
3. **Scarcity:** We all want what is scarce, which explains the effectiveness of limited-time offers.
4. **Consistency/Commitment:** We like to think of ourselves as being consistent; when we commit to a belief or action we tend to stick with it, so it's a good idea to get people to change by starting with a small easy step.
5. **Reciprocity:** We all like to return favours, if I am offered something I will give something back.
6. **Social Proof:** We are influenced by our perceptions and observations about what others are doing.

[263] Kahneman, D. Thinking fast and slow. Oxford University Press. 2011

[264] Ariely D, *Predictably Irrational: The Hidden Forces That Shape Our Decisions.* Harper Collins. 2009

[265] Ciladidi R Influence. The psychology of persuasion. Collins 1994

[266] Goldstein N Martin S, Cialdini R Yes. Fifty secrets form the science of persuasion. Profile Books. London 2007.

[267] Brafman O, Brafman R. Sway. The irresistible pull of irrational behaviour. Virgin. London. 2009

Nudging

In the 1980's, Richard Thaler an economist began importing this new theory into economics, writing a regular feature called "Anomalies" in the *Journal of Economic Perspectives.* Much of this work was later captured in his popular book with Cass Sunstein, 'Nudge'.[268] Nudge like a number of similar books brings together in an easy to digest way some of the neo libertarian philosophy promoted by Thaler and Sunstein together with a number of case studies about how redesigning systems using some of the theory of behavioural economics and social psychology can make it easier for more people to make positive social choices, albeit choices that do not always require them to fully engage with a decision.

What are Nudges?

Nudges are a key mechanism for an approach to social transformation called 'liberal paternalism'. A central tenant of this position is that most large behavioural issues faced by society stem from a combination of personal choice, environmental factors, cultural factors and economic factors and that there is now a growing body of evidence from many disciplines that people:

1. Do not always act in an economically logical way e.g. we do not always act in a way designed to maximise our own advantage.

2. People do not often rationally and logically analyse behavioural decisions, many decisions are processed by what Thaler and Sunstein call the 'automatic' mental system, in a process that Thaler and Sunstein call '**mindless choosing.'**

In addition to the power of mindless choosing Thaler and Sunstein review a number of findings from the field of behavioural psychology and a number of other fields to lay out a set of concepts that can help inform people with the responsibility for developing choice situations in social programmes, (Thaler and Sunstein call these people 'Choice architects') to guide how choices and prompts to behaviour can be set up. These concepts include:

Over confidence

The power of loss

Representation

Framing of offers

The power of temptation

Anchoring

Below each of these and other behavioural economics concepts are briefly described. The hallmark of this kind of 'paternalism' is a focus not on tackling the determinants of health issues by punishing 'bad' behaviour or by nagging people about what they should do. Rather the focus is on incentivising positive choices and creating the conditions or systems in which people feel able to and want to make constructive choices for their own and their families' benefit, or constructing choices that require little of no effort that result in a positive personal and social benefit such as vaccination.

[268] Thaler R and Sunstein C. *Nudge. Improving decisions about health, wealth and happiness.* New Haven & London: Yale University Press. 2008.

Thaler and Sunstein describe 'Choice Architecture' as designing systems and services in such a way that the good choice, the healthy choice is the easy and rewarding choice.

This kind of paternalism locates responsibility with individuals but also with providers of public services, NGOS's and private organisations to create the choice architecture that will nudge people in the right direction. Thaler and Sunstein's also make the case and give a number of examples about how nudges can be designed and implemented in such a way that they are cost effective. A key part of the nudge agenda is to find low cost interventions that produce high value returns. Thaler and Sunstein's concept of 'Nudging' people into different behaviours encompasses interventions that are:

> *"Easy and cheap to avoid. Nudges are not mandates.*
>
> *Putting fruit at eye level counts as a nudge. Banning junk food does not".*

Libertarian Paternalism as advocated by Sunstein and Thaler (2003)[269] seeks a middle ground between a state dominated coercive paternalistic approach to creating social change and a more liberal approach that emphasises free choice and the power of the market as the key driver. They argue that nudges are a practice representation of this middle ground. Around the world many governments are setting out new approaches to public service delivery that emphasises the power of civic society to tackle the big social challenges rather than a focusing on just the direct action of what governments and departments of state can deliver. These developments are also being driven in many parts of the world by a reassessment in the wake of the recent economic downturn of developing more cost effective and sustainable forms of social intervention. This approach is placing more emphasis on the need to:

1. Realign many of the current social programmes so that they reflect the contribution of citizens, NGO's the private sector as well as government action in response to social challenges.

2. Develop supportive and encouraging approaches to social change rather than coercive forms of intervention.

3. Develop approaches that maximise both choice and responsibility among citizens.

4. Develop more targeted and segmented interventions aimed at specific groups for example developing special programmes for assisting the very poor.

5. Develop approaches that demonstrate savings and value for money.

Nudges can be characterised as:

- They are positive i.e. they give positive rewards or only minor penalties.
- They are voluntary.
- They are avoidable.
- They are passive/ easy, i.e. require little effort and work on mindless choosing.

[269] Sunstein C and Thaler T (2003) *Libertarian Paternalism Is Not an Oxymoron.* The University of Chicago Law Review The University of Chicago Law Review. Vol 70. Fall 2003. No4.

- They are low cost, to both the person targeted and to the government or organisation utilizing them (consequently they are highly cost effective).

Nudges by their nature are then still paternalistic. They are top down, they are designed by 'Choice Architects' not by the people themselves, they are directive, they are controlling. In this sense the application of a Nudge based approach to public health runs counter to some of the newer public health policy drives for a more citizen directed, whole society response to issues such as pandemic events[270]. It is also clear that in many circumstances Nudging people into better health will not result in population level improvements because in some circumstances evidence will make it clear that there will need to be other forms of intervention. Therefore, Nudges could be seen as a helpful part of the solution but not a magic bullet. Common Nudging tactics and mechanisms include such approaches as, using the power of social norms and our desire to reflect the behaviour of others and by so doing gain approval. Using our fear and aversion to loss to promote change. Using the power of inertia in human behaviour through default systems that require little or no effort intellectually or physically. [271]

Useful Summaries of Key Behavioural Economic Tactics

Two review documents have been produced which give helpful summaries of key strategies and tactics that can be derived from behavioural economic thinking. These papers are the New Economics Foundation [272] and the UK government Behavioural Insight teams 'Mindspace' review[273].

The New Economics Foundation summary distils the behavioural economic approach into seven key principles for policymakers:

Seven principles

1. Other People's Behaviour Matters

Behaviour of individuals is strongly influenced by other people's behaviours, from friends and family to community groups and classmates. The following are different processes that can influence behaviours: Social learning, people look to others for cues on how to behave in certain situations. People change by aligning their behaviour to that of their role models, rather than by considering their conduct philosophically, or by reading public education leaflets. Social learning theory can help us understand why some ideas and practices spread expotentially with virtually no promotional activity on the part of government or institutions, whilst other practices persist stubbornly, despite mass attempts to reduce or eliminate them.

Social capital, as discussed in section four. Social Capital consists of the 'networks, norms, relationships, values and informal sanctions that shape the quantity and co-operative quality of a society's social interactions'.[274] There is intrinsic value in social

[270] WHO Pandemic Influenza Preparedness and Response. WHO Geneva 2010.
[271] Thaler R and Sunstein C. *Nudge. Improving decisions about health, wealth and happiness.* New Haven & London: Yale University Press. 2008.

[272] Dawnay, E and H Shah 2005. Behavioural Economics: 7 Principles for Policymakers. The New Economics Foundation.

[273] Dolan P, Hallsworth M, Halpern D, Kind D, Vlaev I. Mindspace, influencing behaviour through public policy. Full Report Cabinet Office. Institute for Government. London2010

[274] Halpern D et al (2004) Personal Responsibility and Changing Behaviour: the state of knowledge and its implications for public policy p. 28

networks that exist between people and communities and in general, higher levels of social capital mean that people are better equipped to deal with situations such as a threat/natural disaster etc. Social norms are the rules that a group uses for appropriate and inappropriate values, beliefs, attitudes and behaviours. People are influenced by prevailing opinions in society and their perception of these norms will greatly influence their behaviour.

2. Habits are Important

When we do something out of habit, we don't use much cognitive effort. Behaviour moves from being internally guided through attitudes and intentions to being controlled by environmental cues through habit. For example, individuals don't always act in their own best interest if it is against habit i.e. buying a particular product in the shop because you always do, not because it is the cheapest/best. Three features of undesirable (bad) habits make them strong and durable structures: frequency, automaticity (doing the thing without thinking about it) and functionality (a reward is attached to the habit). When people have developed strong habits they are less attentive to information and don't relate attitudes and intentions to the habit. So, although some behaviour change theories (Theory of Planned Behaviour) state that attitudes and intentions predict behaviour, these links can be weakened by habits. However, good habits can also be established and behaviour change interventions seek to establish new behaviours that are performed frequently and resistant to other influences.

3. People are Motivated to 'do the right thing'

Individuals routinely forego narrowly conceived self-interest for the sake of altruistic motives. For example, someone might volunteer for a charity because it makes them feel good to help people, not so they can get paid for it. This is the notion of altruism and cannot be explained by traditional economic rational man model. When people are motivated to 'do the right thing' they can feel guilt if they fail. It has been found that this guilt can be offset by a punishment (i.e. a fine) because this can help clear the conscience.

4. People's Self-Expectations Influence how they Behave

People want their behaviours and attitudes to match. People are motivated to seek consistency between their beliefs, values, and perceptions. Where there is a clash between an individual's actions and values/attitudes, they often resolve the discrepancy by changing the values or attitudes rather than the behaviour. However, if attitudes have been openly expressed, e.g. in a public promise, we are more likely to change the behaviour. This shows the important role of commitments. This principle is supported by cognitive dissonance theory, self-discrepancy theory, theory of planned behaviour and social cognitive theory.

5. People are Loss Averse

People will go out of their way to avoid loss but will not go out of their way to gain. So people take large risks to avoid loss but are much more reluctant to take even small risks to achieve possible gains. People are prepared to put about twice as much effort and resource into retaining what they have as they would into gaining something new.

6. People are Bad at Computation

People are bad at calculating probabilities and have internal bias. Decisions made are impacted by how a problem is presented which is influenced by a number of internal heuristic biases that include:

1. **Salience** – We overestimate the likelihood of certain things i.e. winning the lottery, a plane crash, something that happened recently. We underestimate things that happen relatively often.

2. **Discounting** – We underestimate the importance of something that may happen in the distant future. People often choose short term gratification over long term rewards i.e. smoking

3. **Framing** – If a decision needs to be taken between two issues, we are strongly influenced by how the two outcomes are presented. If one appears to be a loss, we will avoid it. Depends on how issues are framed.

4. **Defaults** – If carbon offsetting for flying were included in a plane ticket price with an opt out option, few people would opt out.

5. **Intuition** – We jump to intuitive answers quickly, which can be wrong.

6. **Fundamental attribution error** – Putting more emphasis on personal characteristics rather than situational factors when something happens i.e. person crashes a car and people think it is the driver's fault rather than the icy road.

7. **Price signals** – When offered something for free, we undervalue what it is that we are offered.

These biases all show us that people don't always act in their own 'best interest' and aren't always rational when taking decisions. The health belief model suggests ways to influence people's perception of risks so that they believe they are at personal risk of, for example, contracting an illness. The health belief model also assumes that people will take preventative action for the health and engage in health promoting behaviours if they realise they are at risk.

7. People need to feel involved and effective to make change

If people feel helpless and out of control they are often incapable of doing anything to change their situation. Control of a situation can bring motivation. For example, too much information/choice can confuse people and make them avoid making any changes/choices at all. Knowledge is necessary for, but not sufficient to produce, most behaviour changes. Change is more likely if the health damaging behaviour is not part of an individual's coping strategy. Perceptions, motivations, skills, and the social environment are also key influences on behaviour. For example, an individual's perception of their vulnerability to a risk and its severity is key to understanding behaviour. Also the more beneficial or rewarding an experience the more likely it is to be repeated.

The MINDSPACE Review

The MINDSPACE review states that policy tools such as incentives and information are intended to change behaviour by "changing minds" for example incentives and information need to be supplemented by approaches based on "changing contexts" - the environment within which people make decisions. The report makes that case that there is potential to bring about significant changes in behaviour at relatively low cost by applying some of the principles of behavioural economics to shaping many new social policy interventions. The report states:

> *"Shaping policy more closely around our inbuilt responses to the world offers a potentially powerful way to improve individual wellbeing and social welfare. With this in mind, we set out nine of the most robust (non-coercive) influences on our behaviour, captured in a simple mnemonic – MINDSPACE – which can be used as a quick checklist when making policy"*

The MINDSPACE mnemonic stands for:

Messenger
We are heavily influenced by who communicates information.

Incentives
Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses.

Norms
We are strongly influenced by what others do.

Defaults
We go with the flow of pre-set options.

Salience
Our attention is drawn to what is novel and seems relevant to us.

Priming
Our acts are often influenced by sub-conscious cues.

Affect
Our emotional associations can powerfully shape our actions.

Commitments
We seek to be consistent with our public promises, and reciprocate acts.

Ego We act in ways that make us feel better about ourselves.

The MINDSPACE frame work is combined in the report with the DEFRA [275] 6E's model of policy influence to produce a framework tool that those responsible for social programme development can use to asses and consider different forms of social intervention that address both changing mind and changing context issues.

[275] Demos / Green Alliance 2003. *Carrots, sticks and sermons: influencing public behaviour for environmental goals.* A Demos/Green Alliance Report for Defra.

The 6 Es framework for applying MINDSPACE

In basic terms, MINDSPACE represents the tools for changing behaviour, and the 6 Es constitute the framework within which they can be applied. Bringing them together allows policy-makers to address the over-arching "so what?" question in practical ways. The report makes it clear however, that when applying MINDSPACE in practice it should not simply be seen as an alternative to existing methods. The report states:

> *"Behaviour Change" is part of policy-making, rather than a novel alternative that can be bolted onto policies. Therefore, civil servants need to better understand the behavioural dimension of their policies and actions".*

The fact that these two papers which seek to distil the essence of behavioural economics approach come up with slightly different sets of key principles illustrates the diverse nature of behavioural economics and its unfolding interpretation. However, many of the concepts are shared and these concepts such as inertia and the path of least resistance e.g. making the easiest rather than the best decision do appear to be helpful in developing better understanding of how to encourage people to behave in socially responsible ways.

Why Nudging is Necessary but not Sufficient

One of the key strengths of the behavioural economic approach is that it acknowledges and attempts to address the social influences on people's behaviour. However, one of its limitations is that because it is trying to model people's behaviour some of the interpretations of human behaviour are (perhaps) still necessarily simplistic. For example, in NEF's first principle 'other people's behaviour matters', the assumption is that we copy other people's behaviour. While this does make sense for some situations particularly where the behaviour is relatively straightforward (i.e. following rules when driving in another country), it doesn't play out for more complex behaviours or decisions, such as saving for retirement or making the transition from inactivity to employment.

One of the key weaknesses at the core of behavioural economics from a technical perspective is its relationship with economics as a predictive science. It is clear that in real life, people's attitudes and preferences are likely to change in the face of external pressures and over time. However, economic models are not at their most effective when predicting behaviour in response to big changes in external factors over time. This means that to produce sensible models and predictions, economists tend to work on the basis that preferences are fixed. Economics has evolved over time to take account of more complex problems, such as insufficient information or that, it takes time for people to learn how to act in the most rational way. Other influences or factors may be more likely to trigger change, for example, beliefs in one's abilities to carry out the act.

A further weakness of the behavioural economic approach and also much social psychology is that whilst a large number of observed phenomena about human preferences have been documented there seems to be little research or understanding about the interaction between the different principles, specifically where they might work against each other or how they can be combined. The risk of not knowing the interplay of the different principles is that policy makers may place more weight/significance on one principle, or alternatively equal weight on all principles which may lead to interventions that are not targeting the key behavioural triggers. This suggests further research is required or that when principles of behavioral economics are applied the relevant effect and contribution of each principle needs to be carefully evaluated.

Davies (2007)[276] has expressed concern over relying solely on a behavioural economic approach as it appears that it is attempting to incorporate psychological theory into the standard economic model rather than acknowledging that both economic and psychological approaches yield useful *but different* insights into how to influence behaviour and therefore should be treated as complementary rather than trans-disciplinary.

From an ideological perspective Nudging can be criticised for adopting a paternalistic approach rather than an approach that seeks to maximise personal decision making and community empowerment. Nudges are paternalistic in that the people who are selecting and designing interventions are still experts rather than citizens and are seeking to use their expert understanding of human behaviour to manipulate people all be it in a benign way into a pre-selected behavioural response. A further problem is that often this kind of liberal paternalism is focused not on tackling the determinants of issues such as obesity, or crime, rather, the focus is on incentivising positive individual choices by creating the conditions, social pressure, systems or environments in which people want to make choices for their own benefit, or have to make little effort to 'choose' a personally and socially desirable course of action. 'Choice Architecture' is the process of designing systems and services in such a way that the 'good' choice is the easy and rewarding one and it does not take much effort to make.

This kind of approach locates responsibility for actions with individuals but also with providers of public services, NGOS's and private organisations, to create the choice architecture that will Nudge people in the 'right' direction. Nudges are directive, and they are controlling. It is also clear that in many circumstances Nudging people into better health or away will seldom be enough to result in population level improvements because in many situations, evidence and experience make it clear that there is a need for other forms of intervention that address the causes of these problems. Nudges can be seen as a helpful part of the solution but not a magic bullet. This conclusion was also reached by the House of

[276] at the GES Behavioural Economics seminar 2010

Lords review into behaviour change in public policy which reported in 2011[277]. The report which reviewed how concepts such as behavioural economics were being used in government and the evidence for their effectiveness came to the conclusion that it is important to consider the whole range of possible interventions when policy interventions are designed. The report stated that:

> *"We place particular emphasis on this conclusion because the evidence we received indicated that the Government's preference for non-regulatory interventions has encouraged officials to exclude consideration of regulatory measures when thinking about behaviour change. Though there is a lack of applied research on changing behaviour at a population level, there is other available evidence that the Government need to use to better effect. We were therefore disappointed to find that, although we received some examples of evidence-based policies, such as policies on energy-efficient products and smoking cessation services, we were also given many examples of policies that had not taken account of available evidence, including policies on food labelling and alcohol pricing."*

In general the report found that to date there were few strong examples where behavioural economics had delivered substantial measurable improvements in interventions and that more effort should be put into gathering such evidence. The report concluded:

> *"We also found that a lot more could, and should, be done to improve the evaluation of interventions. This is not only good practice but would help to build a body of research that could inform effective policies targeting population-level behaviour change".*

To an extent this challenge has been taken up and responded to by the UK government's Cabinet Office Behavioural Insight Units first annual report which does set evidence for both the impact on behaviour and financial savings across a range of government policy areas where behavioural economic principles have been applied. [278] [279]

[277] House of Lords, Science and Technology Select Committee – Behaviour Change'. Authority of the House of Lords, London, 2011.
[278] Cabinet Officer Behavioral Insight Unit Annual Update 2010 -11 http://www.cabinetoffice.gov.uk/sites/default/files/resources/Behaviour-Change-Insight-Team-Annual-Update_acc.pdf
[279] Cabinet Officer Behavioral Insight Unit Annual Update 2011-12 http://www.cabinetoffice.gov.uk/sites/default/files/resources/Behavioural-Insights-Team-Annual-Update-2011-12_0.pdf

Conclusion

Most commentators agree that the citizen centric planning and the creation of value via an exchange sits at the heart of all effective social programmes. Exchanges can be what Bagozzi [280] calls restricted, generalised and complex involving one to one or multiple actors and simple transactions or ones involving multiple kinds of transactions. A key factor in developing a powerful exchange proposition is the process of ensuring that what is offered is something that is valued by the target audience. This offer can have both tangible and intangible benefits and according to Vargo and Lusch [281] increasingly it is in the field of intangible benefits and resources, together with the value that comes from the co-creation of value, and relationship building that is a powerful driver for change. Additionally sometimes exchanges are positive i.e. people get a physical, social or psychological reward or benefit, sometimes exchanges can be negative, i.e. people will face a penalty, social disapproval or some other form of negative consequence if they continue to adopt a particular behaviour or fail to comply with a behaviour that is being promoted. A further feature of exchange is that in some choice situations some exchanges are 'passive' i.e. they require little cognitive engagement whilst in other situations some choices involve 'active' cognitive engagement and decision-making.

As discussed above the concept of 'Nudging' has recently emerged from the field of behavioural economics and represents a form of exchange like many other forms of non-rational (System One) influence associated with behavioural economics that requires little cognitive engagement i.e. it is passive and seeks to deliver a positive or only small or avoidable negative consequence if not responded to. Nudging and the application of other principles of behavioural economics as an approach to policy development and tactical implementation is being actively considered by many governments across Europe. However, rather than adopt a position that positive rewards and mindless choosing are the default preferred intervention mode, those responsible for public health interventions when considering what 'Form' [282] of intervention to apply should rather be driven by customer insight alongside evidence from research about what works. Positive rewards and mindless choosing will not work in all situations and that reflection and judgement is also often needed when making many complex decisions to change[283]. The crux of the matter is to discern, based on citizen insight and evidence, what 'Form' of exchange will work in which situation, with which specific target audience.

As will be explored in section eight some social exchanges are positive i.e. the target audience will get a financial physical, social or psychological reward or benefit, and some are negative, i.e. people will face a penalty if they continue to adopt a socially and individually harmful behaviour. However, even these exchanges are designed to have a net positive social effect, fining individuals for driving too fast reduces the overall impact of road deaths on society as a whole as well as saving individual lives. A key factor is to ensure whatever is offered is based on something that is valued positively or seen as a meaningful but fair deterrent or cost by the specific target audience. For example, imposing a penalty fine that is set at a rate that the audience does not consider high enough or when they

[280] Bagozzi, R.P. (1975), "Marketing as Exchange". *Journal of Marketing*, Vol. 39 October, pp. 32-39.
[281] Vargo S.L and Lusch R.F. (2004), Evolving to a New Dominant Logic for Marketing. The Journal of Marketing, Vol. 68 No. 1, pp. 1-17.
[282] The word 'Form' in this context means the extent to which an exchange is framed as a rewards or punishments to motivate compliance and create social value, or uses cost to the citizen and the extent to which it requires the active cognitive engagement of citizens in a choice situation or not.
[283] Grist, M. (2010) Steer: Mastering our behaviour through instinct, environment and reason RSA. London. available at http://www.thersa.org/__data/assets/pdf_file/0017/313208/RSA-Social-Brain_WEB-2.pdf (accessed March 14th 2011).

believe that there is little chance of being caught, will probably not bring about change, but if the rate is too high citizens will oppose the use and collection of a fine.

In addition, some exchanges are 'Active' and some are 'Passive'. Nudges are ideally passive exchanges. A passive exchange is one where people make a decision to act based on more intuitive responses, such as environmental prompts, or by accepting a default option such as being part of a scheme unless they actively opt out. An active exchange is one where people engage in a rational assessment of the exchange, weighing up the pros and cons of the benefits and costs. This process has the added benefit of developing critical judgement capacity and in so doing can assist in many other life choice situations. The following 'Exchange Matrix' [284] is a way to represent four 'Forms' of exchange that can be offered. It can be used as a conceptual Proto Tool for analysing what forms of intervention have, are, or could be used across a programme designed to influence behaviour.

This section of the paper has sought to draw out some of the key issues and features associated with the development of behavioural economics thinking and how they might be applied in the field of pandemic preparedness and planning. This section of the paper has demonstrated that behavioural economics and the concepts that can be derived from it may have important implications for the development of any public health intervention. There are clearly ideological and ethical issues as well as technical issues associated with the application of predictive models that seek to influence behaviour using non-rational and non-conscious decision making that will need to be considered by those responsible for pandemic communication and behaviour change programmes.

The three conceptual Proto Tools set out below : The Cost Value Matrix, and the de-CIDEDS Framework, the Intervention Matrix Tool and the Behavioural Economics Principles Assessment Questions Checklist are suggested tools for reviewing and deciding on what mix of interventions drawing on traditional and behavioural economics thinking might constitute intervention programmes in individual countries or across regions of Europe with regard to pandemic events.

[284] French J. Why nudging is not enough. Social Marketing Journal. Vol 1 Number 2. Emerald Publishing. 2011

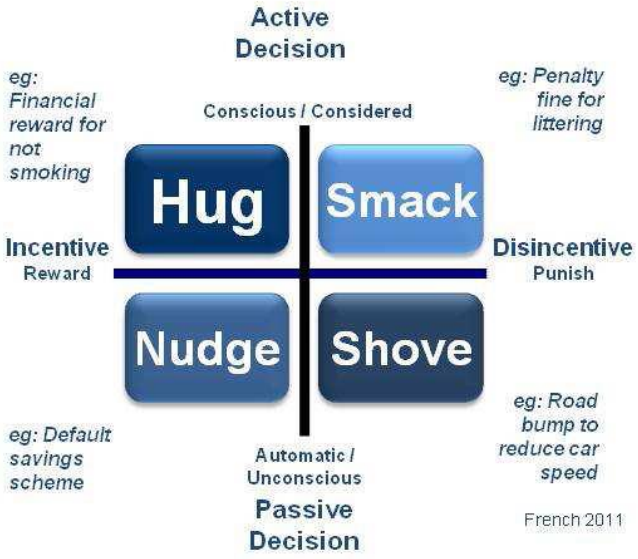
Proto Tool 8

Cost value matrix, the de CIDES Framework and the Intervention Matrix tools.

The Exchange Matrix Tool

The Exchange Matrix is a conceptual device or 'Proto Tool' that can be used to represent four different 'Forms' of social exchange that can be designed to promote change in individuals and groups.

The assumption is that whilst 'Nudges' can be effective in promoting some behaviours in some situations they do not represent a full toolbox. As well as 'Nudges', governments and other organisations can also use, Shoves, Hugs and Smacks. Social interventions may well use a combination of all four.



It should also be noted that the four 'Forms' are not absolutely distinct categories rather they represent more of a continuum of options. The matrix is constructed using two axes, the first: active and passive choosing, and the second: positive and negative rewarding or penalising.

The selection of which 'Form' of exchange or combination of them should always be driven by evidence of effectiveness and target audience insight. Whichever combination is selected there will be an on-going need to evaluate the impact they are having in terms of behaviour change and how they are perceived by the intended target audiences if the impact is to be sustained.

The Exchange Matrix is ideologically neutral, it depends on input from experts and target audiences to define the nature of rewards or penalties. These in most countries will be

developed through existing legal and representative systems of public engagement, for example the level of fines that might be applied to penalise driving too fast will be informed by due legal and economic considerations.

The Matrix indicates the importance of 'Mindful Choosing' as well as 'Mindless Choosing' as being an important option for tackling some behavioural challenges and as a mechanism for many long-term social attitudinal and behavioural change programmes.

The Exchange Matrix can be used to map a variety of 'Forms' of intervention, it can also be used as a device to communicate the range of interventions deployed in a project or programme as a model to help review the comprehensiveness of social programmes. Whilst the Exchange Matrix can help to describe the variety of 'Forms' of exchange that can be used as part of public health behavioural and communication programmes or other kinds of social intervention it is not intended to represent the full range of 'Types' [285] of intervention that can be employed by organisations wishing to bring about social good.

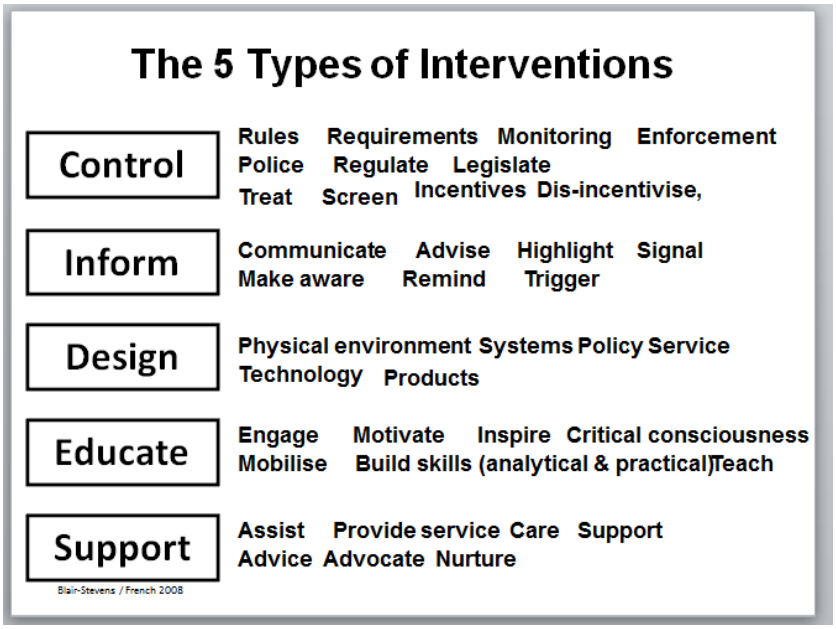
The de-CIDEDS Framework Tool

A key principle of effective health promotion is to apply tailored evidence and insight informed mix of intervention to bring about the desired behavioural goal. In most cases a single intervention is less likely to be effective than multi-component interventions. For example just 'informing' someone of something may have some limited effect, but if this is combined with practical support and a chance to critically consider it with guidance (Education) it may well be more effective. A key task then, is to establish the right mix of interventions given the available resources and time.

The de-CIDEDS framework tool, French and Blair-Stevens (2010) sets out five 'Types' of intervention that can be used to encourage and foster social good.

The de-CIDEDS Framework Tool

[285] The word 'Type' of intervention is used in this context to mean different approaches that governments and public sector institutions can use to bringing about social change or maintaining social benefits. The five Types of intervention open to these organisations are considered to be: Education, Support services provision, Design interventions, Information provision, and Control systems including the law.



Proto Tool 9

The Intervention Matrix Tool

If the Exchange Matrix is combined with the de-CIDEDS framework tool it is possible to construct an Intervention Matrix that combines ‘Forms’ and ‘Types’ of intervention that is capable of representing the vast majority of possibilities available to governments and public organisations when they are developing social interventions.

Those who seek to apply marketing principles to assist with social issues may be able to use this intervention matrix tool to reflect on and analyse the range of intervention ‘Types’ and ‘Forms’ of exchange they might develop to achieve their goals.

The matrix also has descriptive utility in that it may be used to describe the range of 'Forms' and 'Types' of intervention that may be necessary in any programme. As stated above those who use a marketing approach can also help inform and shape broader social interventions that may use a combination of 'Forms' and 'Types' of intervention by ensuring that the 'Form' of exchange and 'Type' of interventions that are selected are based on user understanding and insight

Proto Tool 10

Behavioural Economics Principles Assessment Questions Checklist

This Proto Tool is a combination of key principles of behavioural economics that planners can use as a check list of potential ways to influence behaviour as part of the tactical execution of programmes drawn from the behavioural economic texts sighted in this section of the paper and previous sections and annexe one.

1. **Making it easy**
   How can we make the message easy to understand and the behaviour easy to do?

2. **Consistency**
   How can we ensure that the first step to change or compliance is a very easy one?

3. **Benefit now**
   How can we make the benefit of the action something the audience gets now or very soon?

4. **Messenger**
   Is the messenger we have chosen seen as likable and authoritative and can do people relate to them?

5. **Incentives and Penalties**
   What can we offer as a positive incentive and how can we frame losses that will accrue if action is not taken?

6. **Habits**
   How can we set up new habit that supports the public health objective?

7. **Engagement**
   How can we engage people in the planning delivery and evaluation of the programme?

8. **Social Norms**
   Is there a social norm that we can use to influence the behaviour?

9. **Salience**
   How can we make our message, advice and support interesting and exiting?

10. **Scarcity**
    How can we position the offer as one that is limited and time dependant?

11. **Reciprocity**
    What exchange can we offer that will set up an obligation to act?

12. **Framing**
    How can we frame the message or ask so that it is appealing and reduces loss?

13. **Priming**
    How can we influence the subconscious by using cues such as design, images, sound, colours smells etc?

14. **Emotion**
    What emotional appeal will work best with our target audience?

15. **Commitment**
    How can we get the audience to make a public commitment to the behaviour we are targeting?

16. **Consistency**

How can we get people to view the action as being consistent with their current views beliefs and / or actions?

17. Simple

How can we get rid of difficult calculations and the need for complex risk assessment?

18. People's self-expectations influence how they behave

How can we help people with develop the skills they need to act?

19. Risk perception

How can we frame the risk so that it is perceived to be relevant, likely and serious enough to warrant action?

20. Ego

What can we do to frame the ask so that it makes the audience feel better about themselves?

"Too often, people create an elegant plan around

the wrong premise or the wrong goal"[286]

Understanding from the Field of Behavioural Programme Planning

Introduction

As stated in section six and seven when planning health promoting programmes aimed at pandemic events or other public health challenges, theories and models should have a central role in assisting the design and evaluation of the effective programmes[287] [288]. However, an equally important factor in the delivery of an intervention is the application of a logical and documented planning approach that is capable of interrogation and able to produce learning about what worked well what did not and what aspects of a programme were efficient in terms of demonstrating a good return on investment and value for money. In short, systematic planning processes are key to understanding not only which elements of a programme were most successful but also which were the most efficient.

At the moment many health promotion campaign programmes have the following characteristics which ultimately mean that they are difficult to evaluate and suffer from a range of implementation weaknesses:

- Many behaviour change programmes are constructed by experts and policy planners and driven down through public health systems and the media to influence behaviour. This approach which is influenced by political as well as public health considerations is driven by health ministers and biomedical "experts" and does not always include citizen insight research into the behaviours and beliefs of the target group. The result is that often the messages can be misunderstood or viewed as irrelevant by the people they are intended for. This approach results in recipients filtering out messages.

- Many programmes are short lived and open to constant revision. Timescales are often short-term with little baseline evidence for action and evaluation of the impact. These short-term campaigns are often focused on and evaluated through an assessment of impact on agenda management rather than population behaviour change.

- Many programmes are not adequately performance or programme managed. Activity is focused around developing messages and targeted media buying with the result that vital planning, insight and evaluation stages are neglected. This focus on

[286] Bill Novelli. Now Hear This, 2001, Fenton Communications • 1320 18th Street, NW, Washington DC 20036 • 202-822-5200 • www.fenton.com. Sponsored by the David and Lucile Packard Foundation
[287] Green J. Tones K. Health Promotion: Planning and Strategies. Second. London: Sage;2010.
[288] Brown D, McWilliam C, Ward-Griffin C. Client-centred empowering partnering in nursing. Journal of Advanced Nursing. 2006 Jan 1;53(2):160-8.

activity results in programmes that are one dimensional and do not have widespread stakeholder engagement so the programme rapidly fades from consciousness.

- There is a tendency to repeat public health information to the public in the same format/style instead of developing the message over time so that it changes to meet the expectations/needs of target groups. The result is that people are bored and the information is largely ignored.

- Campaigns often lack co-ordination and integration between the many policy directives across governments. This can result in public health campaigns that provide contradictory advice which in turn can confuse the target groups.

- Many public health programmes have significant (sometimes unrealistic) goals and begin with a large fanfare but soon lose momentum because implementation has not been planned adequately.

- There are few programmes that utilise a full intervention mix of education, design, support services and control measures and often programmes are insufficiently funded to achieve their stated goals.

These common weaknesses are evident in many interventions focused on pandemic events as outlined in sections 3, 4, 5 and 6 of this paper. This set of weaknesses is developed further as a Proto Tool checklist at the end of this section of the paper.

The Characteristics of Successful Behavioural Intervention Planning

In this section the various factors that are characteristic of many successful not for profit behaviour change programmes are reviewed. They represent the main universal underlying principles of success i.e. irrespective of the disease issue, target group, target behaviour or country context. These characteristics in many ways set out a counterpoint to those weaknesses set out above. Although specific programmes themselves cannot often be replicated, evidence derived from literature and programme evaluation demonstrates that there would appear to be a number of common characteristics that most successful programmes exhibit. Clearly programmes aimed at influencing human beliefs, attitudes and behaviour are complex in nature. The MRC[289] guidance on developing and evaluating complex interventions already reviewed in this paper sets out a number of helpful questions that planners and researchers should address when seeking to set up such programmes. In the planning and early development stages of a programme these questions include:

[289] Medical Research Council. Developing and evaluating Complex interventions,.2010www.mrc.ac.uk/complexinterventionsguidance

1. Are you clear about what you are trying to do, what outcome you are aiming for, and how you will bring about change?

2. Does your intervention have a coherent theoretical basis?

3. Have you used this theory systematically to develop the intervention?

4. Can you describe the intervention fully, so that it can be implemented properly for the purposes of your evaluation, and replicated by others?

5. Does the existing evidence, ideally collated in a systematic review, suggest that it is likely to be effective or cost effective?

6. Can it be implemented in a research setting, and is it likely to be widely implementable if the results are favourable?

The paper gives guidance that if any of these questions cannot be fully answered there is further development work needed before projects are initiated. With regard to piloting and feasibility studies the guidance sets out a further couple of questions that need to be considered:

1. Have you done enough piloting and feasibility work to be confident that the intervention can be delivered as intended?

2. Can you make safe assumptions about effect sizes and variability and rates of recruitment and retention in the main evaluation study?

With regard to evaluation the guidance poses the following questions:

1. What design are you going to use, and why?

2. Is an experimental design preferable and if so, is it feasible?

3. If a conventional parallel group randomised controlled trial is not possible, have you considered alternatives such as cluster randomization or a stepped wedge design?

4. Have you set up procedures for monitoring delivery of the intervention and overseeing the conduct of the evaluation?

The paper also recommends that including a process evaluation is a good investment to explain discrepancies between expected and observed outcomes, to understand how context influences outcomes, and to provide insights to aid implementation. Including an economic evaluation will likewise make the results of the evaluation much more useful for decision-makers. The paper also goes on to make a number of recommendations with regard to summarising findings and reporting results.

NICE [9] has also developed a set of planning guidance for behavioural interventions, recommendations that cover much of the same ground as the MRC guidance, specifically NICE sets out three core actions related to generic planning principles:

1. Plan carefully interventions and programmes aimed at changing behaviour, taking into account the local and national context and working in partnership with recipients. Interventions and programmes should be based on a sound knowledge of community needs and should build upon the existing skills and resources within a community.

2. Equip practitioners with the necessary competencies and skills to support behaviour change, using evidence-based tools. (Education providers should ensure courses for practitioners are based on theoretically informed, evidence-based best practice.)

3. Evaluate all behaviour change interventions and programmes, either locally or as part of a larger project. Wherever possible, evaluation should include an economic component.

It is possible to add to this list of core recommendations a number of further common characteristics associated with effective public health planning. These include:

Clarity of Purpose

> *"A successful programme, no matter how we define it, has got to begin with very clear, realistic, measurable goals," says Barbara Beck of the Pew Charitable Trusts. "Campaign goals that are not explicit and realistic"*[290]

Behaviour change programmes require a set of clear measurable and sensible behavioural objectives that need to be achieved in the timescales of the programme. Often many governmental public health programmes have unrealistic, or in the opposite extreme, no objectives. These objectives need to be based on thorough research about what is achievable and realistic. According to Bill Novelli of AARP, picking the wrong goal is one of the most common mistakes that public health organisations often make. A fundamental principle is that public health organisations need to move towards an even sharper focus on measuring outcomes rather than process activity tracking as a principle measure of progress. Clear outcome targets that accurately measure 'health' impact are essential. Many health outcome targets tend to focus on morbidity, mortality. These types of targets in behavioural terms can also be augmented by targets focused on the populations reported and observed protective behaviour in accordance with guidance during each of the pandemic phases such as the uptake of vaccines and compliance with good hygiene practice. As stated in the previous section of this paper the development of SMART objectives related to each programme aim can help to sharpen the clarity of purpose of pandemic programmes.

[290] Now Hear This, 2001, Fenton Communications • 1320 18th Street, NW, Washington DC 20036 • 202-822-5200 • www.fenton.com. Sponsored by the David and Lucile Packard Foundation

Policy Coherence and Integration

It is vital that behaviour change programmes are planned and implemented across institutional, departmental and in the case of pandemic events, international borders. A multi-faceted approach where a number of sections of government and stakeholder partners combine with a joint vision of what they want to achieve has a much higher chance of success than single initiatives developed in silos. It is always critical to ensure policy coherence; there are numerous examples of programmes across government which have contradictory aims and objectives.

> "*It follows from the evidence presented here that there is no single intervention, and no simple remedy, that can reduce the burden of chronic diseases. As we have learned from our experience with tobacco, it requires a prolonged commitment of skills and resources in a multi-setting, multi-factor, multi-strategy approach*."[291]

The vast majority of successful behavioural programmes then tend to utilise a combination of strategies across government/NGO's/Stakeholder organisations to achieve change.

> "*The most successful interventions in reducing smoking rates have involved combinations of policies, including price increases, advertising restrictions, smoking site restrictions, consumer education and smoking cessation therapies*."[292]

Another key to success in the development and delivery of public health programmes that aim to influence behaviour is the development of both internal and external coalitions of supporters and stakeholders who share similar goals and aspirations. Working with external stakeholders can provide useful insights into consumer behaviours. For example, the development of the Change for life Obesity Social Marketing Strategy in the UK [293] involved many retail organisations who contributed valuable insight into behaviours of key groups of consumers/target groups. Stakeholders can also act as trusted sources who are close to target groups and are perceived to be credible and authoritative message givers. The national Institute for Health and Clinical Excellence endorses the need to work with and through relevant stakeholders when developing and delivering public health campaigns.

It is "*vital that any behaviour change programme should be developed in partnership with stakeholder organisations*"[294]This finding is supported by many government agencies [295]

Customers Driving the Intervention

Many behavioural change interventions are based on evidence derived from published studies and analysis of epidemiological data. This information is vital but not sufficient to develop effective behavioural interventions. In contrast the commercial sector invests heavily in market research to understand people's motivations, needs, wants, fears, aspirations and why they would purchase goods or services. Public health interventions need to enhance

[291] Prevention that works. A Review of the Evidence Regarding the Causation and Prevention of Chronic Disease Consultation draft. November 2003 Chronic Disease Prevention Initiative: Paper #2 Prevention and Wellness Planning Population Health and Wellness Ministry of Health Planning Victoria BC
[292] Goodman C, Anise A (2006). What is known about the effectiveness of economic instruments to reduce consumption of foods high in saturated fats and other energy-dense foods for preventing and treating obesity? Copenhagen, WHO Regional Office for Europe (Health Evidence Network report; http://www.euro.who.int/document/e88909.pdf
[293] Department of Health. Change 4 Life , one year on evaluation, 2010. Department of Health. London.
[294] NICE Guidance on Behaviour change (OCT 2007)
[295] Department of Work and Pensions

their understanding of target group motivations if they are going to be able to develop effective programmes.

> "*We must be relentlessly customer focused. Many people want a single point of contact for a range of services. The public are not interested in whether their needs are met by Department X or Agency Y, they just want a good, joined up service where X and Y talk to each other and share the information the public have provided. We should strive to meet this demand*."[296]

> "*If we don't understand what really matters to the people we are trying to reach, we will waste time and money and risk compromising our reputation by offering services which customers don't recognise as being for them and have difficulty accessing. We will base our management of those services on an illusion, recording as a triumph each duplicative and unnecessary phone call because it has been dealt with within the target time allowed. The complex social problems of exclusion, many of which can be alleviated by early intervention, will remain intractable*."[297]

What these quotes and the discussion in sections three through to six make clear is that without a deep understanding of the target audience the development of an effective campaign, be it aimed at understanding, influencing beliefs or behaviour will stand little chance of success.

The Need for Sustained and Outcome Focused Budgeting

When investing in behavioural change programmes there is a threshold point that must be reached in terms of population awareness and action before any return on investment can be measured. In an increasingly competitive environment for attention and engagement, public health programmes are often not funded to a sufficient level that they are able to achieve 'cut through' and recognition to their intended audiences. As indicated at the start of this section insufficient levels of investment are often compounded by stop start approaches to investment.

The amount to be invested to achieve measurable impact on behaviour in target segments is a key factor to be determined in the development phase of any planned programme. A second key consideration is the time frame over which an investment will need to be maintained to achieve the targets of the programme. If funders are not able to commit sufficient funds over the required period they must be made aware that the impact of their more limited investment may be reduced further by a lack of perseverance. Impact over time is a key issue to be addressed when putting together a full business case for investing in behavioural change. A move towards outcome based budgeting can be aided by the adoption of what has been called the 'Three step process' [298] for budget allocation to behavioural programmes.

This model recommends that rather than allocating a fixed amount of financial resources to scope, develop, implement and evaluate a programme it is more effective if budgets are

[296] Sir Gus O'Donnell, Cabinet Secretary, quoted in Customer insight in public services "A Primer" October 2006, p.1

[297] Customer insight in public services "A Primer" October 2006, p.1

[298] French J Commissioning Social Marketing. In Social Marketing Theory and Practice Oxford University Press 2010.

allocated in three steps. First a budget should be allocated to scope an issue, to understand the problem audiences and the assets that exist or could be brought into play and the obstacles to success. The key output from this scoping phase is a report that sets out a clear statement of the problem and desired improvement, initial intervention propositions based on a review of evidence, data and market research and a plan for a 'development phase' to refine the proposed interventions.

On completion of a scoping stage and based on the report that it produces commissioners should then allocate a second budget for development. This phase will work up the proposals, undertake field testing and refinement or if necessary redesign the proposed interventions so that they meet the requirements of the programmes and are acceptable to the target market and stakeholders. After the development phase, a full business plan can be developed which should form the basis of full funding allocations to scale up and fully implement the recommended interventions and evaluate their impact.

If this three step approach to funding is applied by funders and if it is complemented by public health practitioners in the public sector setting out the evidence for their recommendations, estimates of projected savings and value for money analysis the chances of well executed behavioural intervention will increase, and it will be possible to build a costed evidence base for public health that will inform future planning and delivery. The need to develop a greater focus on the design of efficient as well as effective programmes is not without complexity as a number of economic factors will need to be taken into account when assessing the overall economic impact of a programme.

> "*There are also wider economic benefits to individuals and society, arising from reductions in the effects of passive smoking in non-smokers and savings to the health service and the employer. These wider benefits are often omitted from economic evaluations of cessation interventions, which consequently tend to underestimate the true value for money afforded by such Programmes.*"[299]

However, a key and common error often made in the public sector is for behavioural change programmes that have achieved success in one particular environment to be transported directly to another without any of the key planning processes that have been outlined in this and previous sections being put in place. What works in one environment may not be able to be directly replicated in another.

> "*Studies of tax, price and behavioural change policies applied to tobacco and alcohol products in many countries provide persuasive evidence of their impact on decreasing consumption of those products. These policy interventions may serve as models for similar approaches for lowering consumption of highly saturated fats or other energy-dense foods. However, critical differences among these types of interventions may limit their generalizability to food consumption*"[300]

[299] Economics of smoking cessation, Steve Parrott and Christine Godfrey, BMJ 2004, p. 947

[300] Goodman C, Anise A (2006). What is known about the effectiveness of economic instruments to reduce consumption of foods high in saturated fats and other energy-dense foods for preventing and treating obesity? Copenhagen, WHO Regional Office for Europe (Health Evidence Network report; http://www.euro.who.int/document/e88909.pdf,

Systematic Planning and Development of Interventions

A key weakness as highlighted in the beginning of this section of the paper is that there is in many public health interventions a lack of systematic planning through many of the key stages of behavioural programmes (Scoping, development, launch, implementation, evaluation, dissemination). Many programmes quickly move to creating messages and investing in mass media programmes without sufficient effort put into developing robust plans and testing them. Good planning entails, as noted by NICE and MRC two key considerations:

The need to spend time and resources on planning.

Planning for the best case and worst-case scenarios.

Looking at the issue from every angle.

Review of potential solutions.

Knowing who your allies and enemies are.

The need to think through the total strategy before moving to tactics.

As Jon Haber puts it

> *"The laziest thing people do is go right to tactics. You have to start with what you are trying to get done, who can get it done for you, what you have to tell them, and who has to tell them to persuade them."*[301]

These two key factors are well known but the reality is that many communication and behaviour change programmes are not based on well-articulated and recorded planning templates that cover all of the key elements of what is considered to be good planning principles. This lack of systematic planning in many public health communication programmes exists despite the existence of a number of well-designed systematic planning models that have been developed for health promotion and for 'not for profit' behaviour change interventions. One of the clear challenges is to encourage practitioners to use these models and for sponsors to insist that some form of systematic planning is used to structure programme delivery and evaluation. Rather alarmingly, one study by Godin et al[302] using an instrument based on nineteen planning tasks in the intervention mapping framework developed by Bartholomew et al[303] found that of 123 projects assessed only 15% properly completed an objective setting stage and only 25% completed any form of theory – practice assessment. There is clearly a case as Haglund et al[304] suggest for:

- More user friendly planning instruments for practitioners
- Quality assessment instruments that reflect the reality of practice
- More professional training for those responsible for developing and delivering plans.

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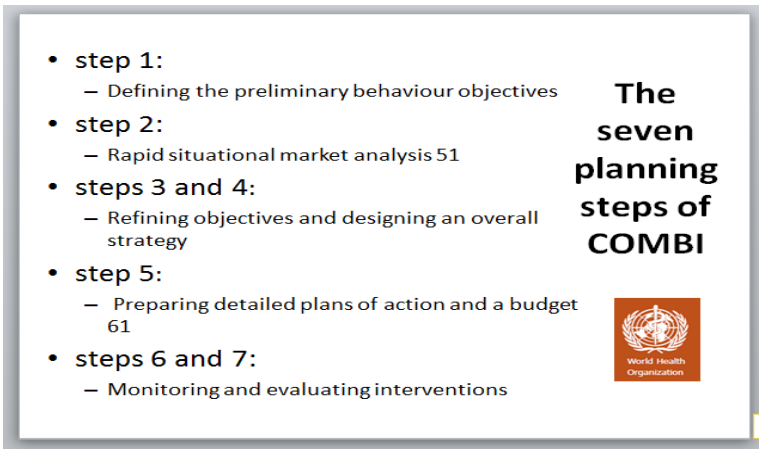
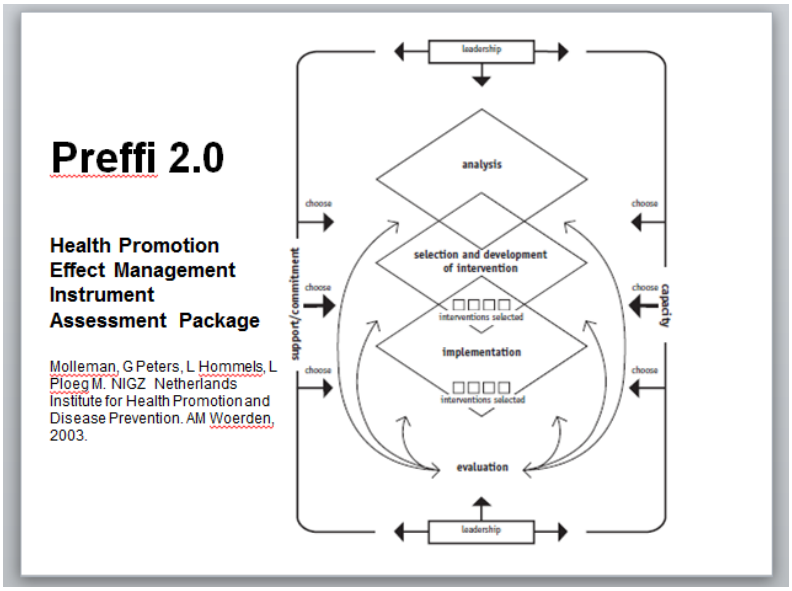
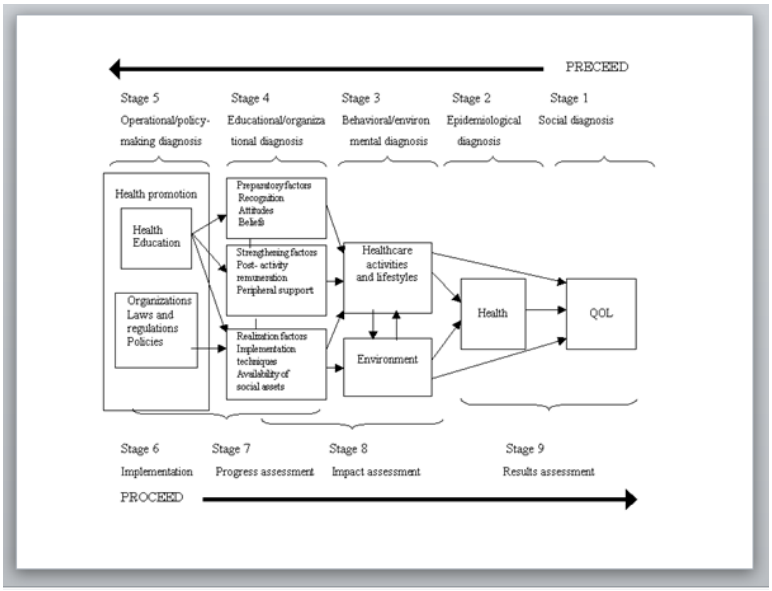
[301] Now hear this. 2001. Fenton Communications • 1320 18th Street, NW, Washington DC 20036 • 202-822-5200 • www.fenton.com. Sponsored by the David and Lucile Packard Foundation
[302] Goodin G, Gagnon H, Alary M, Levy J, Otis J, The degree of planning: an indicator of the potential success of health education programmes. Programmes and education. XIV (3): 138. 2007
[303] Available at www.msss.gouv.qc.ca/its/outilplanification
[304] Haglind B, Jansson B, Petterson B, Tillgren P, A quality assurance instrument for practitioners, In Davis J and MacDonald G (eds) Designing health messages. Thousand Oaks. C.A Sage. 1988.

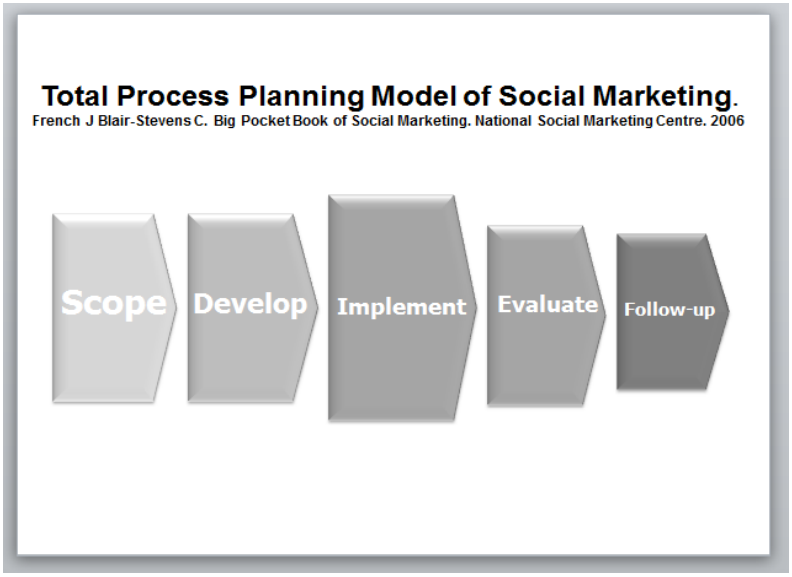
Some of the better known approaches and models are the Who sponsored COMBI planning model[305], the PRECEDE-PROCEED planning framework [306] the PREFFI2 [307] , (The Health Promotion Effect Management Instrument) and Social Marketing[308].

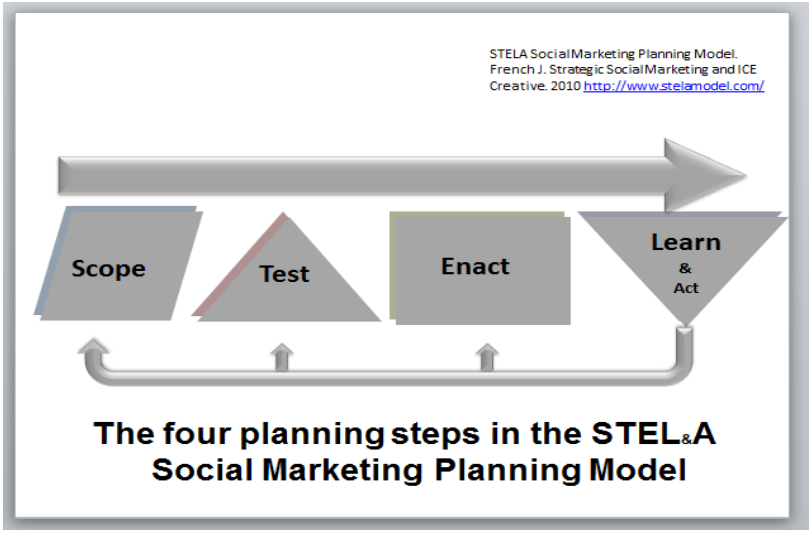


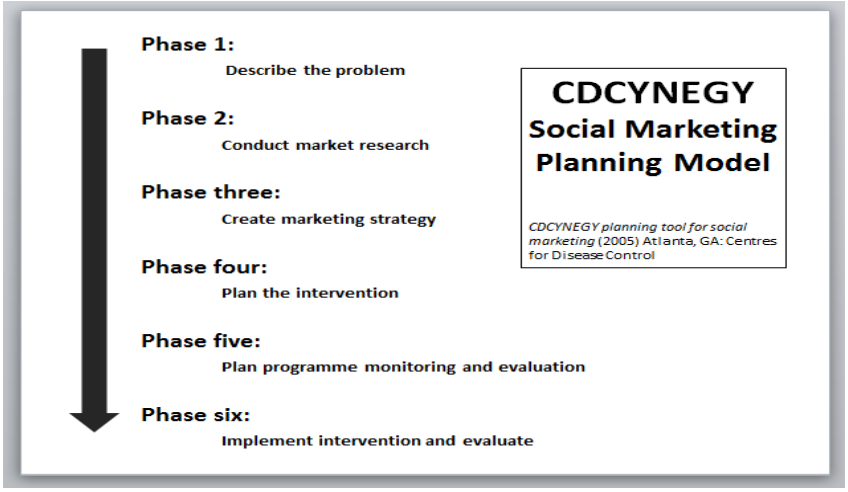


[305] COMBI Communication for Behavioural Impact. WHO A tool for behavioural and social communication in outbreak response. WHO. 2012
[306] Green, L., Kreuter, M. (2005). Health program planning: An educational and ecological approach. 4th edition. New York, NY: McGraw-Hill
[307] Preffi 2.0. Health Promotion Effect Management Instrument Assessment Package Molleman, G Peters, L Hommels, L Ploeg M. NIGZ Netherlands Institute for Health Promotion and Disease Prevention. AM Woerden, 2003
[308] Social Marketing is a field of study and research rather than a single change model but a number of social marketing planning models been developed two well-developed examples include, STEL; Social Marketing Planning Model. French J. Strategic Social Marketing and ICE Creative. 2010 http://www.stelamodel.com and the CDC. *CDCYNEGY planning tool for social marketing* (2005) Atlanta, GA: Centres for Disease Control. Total Process Planning Model of Social Marketing. French J Blair-Stevens C. Big Pocket Book of Social Marketing. National Social Marketing Centre. 2006


PRECEED
Stage 5
Operational/policy-making diagnosis
Stage 4
Educational/organizational diagnosis
Stage 3
Behavioral/environmental diagnosis
Stage 2
Epidemiological diagnosis
Stage 1
Social diagnosis
Health promotion
Health Education
Organizations Laws and regulations Policies
Preparatory factors Recognition Attitudes Beliefs
Strengthening factors Post- activity remuneration Peripheral support
Realization factors Implementation techniques Availability of social assets
Healthcare activities and lifestyles
Environment
Health
QOL
Stage 6
Implementation
Stage 7
Progress assessment
Stage 8
Impact assessment
Stage 9
Results assessment
PROCEED


Total Process Planning Model of Social Marketing.
French J Blair-Stevens C. Big Pocket Book of Social Marketing. National Social Marketing Centre. 2006
Scope
Develop
Implement
Evaluate
Follow-up


STELA Social Marketing Planning Model.
French J. Strategic Social Marketing and ICE Creative. 2010 http://www.stelamodel.com/
Scope
Test
Enact
Learn & Act
The four planning steps in the STEL&A Social Marketing Planning Model



Each of these planning models set out a number of key steps that proceed from analysis through development and into implementation and evaluation. Each of the planning models key steps are slightly different but the COMBI model is closer to the CDCYNEGY, TPP model and the STELA social marketing model in approach. Whilst Greens PRECEDE model explicitly starts with the determinants of health analysis it is in terms of its structural components set out in a similar logical sequence of steps that involve problem analysis through to programme planning, implementation and evaluation. The PREFFI model is a combination model that can be used to structure a plan but also as a quality assessment tool for existing plans. There are also a large number of more prescribed planning models that have been developed not specifically for behavioural change within the public health field but rather focused on related specific issues, such as enabling community empowerment [309] and the role of advocacy programmes[310].

Many of these planning approaches have their origin in, or are closely related to the planning process known as 'Logical Frameworks' or 'Outcome Mapping', developing 'Intervention Logic', 'Programme Theory' which all refer to similar processes (although there may be a difference of emphasis and focus). Log Frames as they are most often known are an approach to planning that has its roots in military planning but were adapted for social programme design by the USAID programme in 1969 [311]. According to Hills [312] 'Logic Mapping' is popular because it uses a simple visual framework with key headings to describe a logical and staged process under a set of key task areas. This approach is particularly recommended as part of a 'Theory Based' or 'Theory of Change' approach to evaluation, but can also be valuable alongside other evaluation approaches. 'Logic Mapping'

[309] Bracht N, Kingsbury L, Rissel C. (1999) A five stage community organisation model for health promotion In Bracht N (ed) Health promotion at the community level. New advances. Thousand Oaks CA. Sage.

[310] Maylock B, Howat P Slevin T (2001) A decision Making model for health promotion advocacy. Promotion and Education VIII (2) 59-64.

[311] Nanacholas S (1998) How to do (or not do) a logic framework. Health Policy and Planning. 12 (2): 189-193.
[312] Hills D. Logic Planning Hints and Tips. Tavistock Institute. London. 2010

requires practitioners to identify and describe a number of key elements of their intended intervention.

These typically include:

1. The issues being addressed and the context within which the intervention takes place.

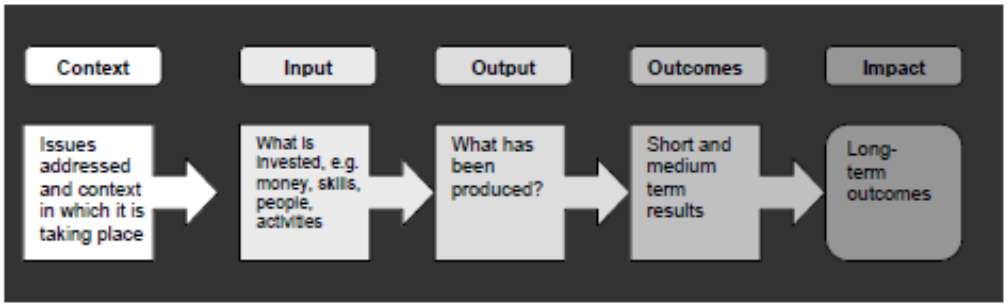
2. The inputs – resources and activities – required in order to achieve intervention objectives.

3. Outputs (e.g. in terms of target groups to be engaged, roads built, products developed)

4. Outcomes (i.e. short and medium-term results, such as changes in traffic flow levels and model shifts)

5. Impacts (i.e. long-term results such as better quality of life, improved health, environmental benefits etc.)

Components of an Intervention Logic Map



'Logic Mapping' is widely used in the planning and design of new interventions. A number of different 'types' of 'Logic Mapping' can be identified in the literature including those with an 'outcome' focus, those with an 'activity' focus and those with a 'theory' focus [313] .

'The Logic Mapping' process also involves developing consensus amongst stakeholders about interventions, outcomes and impacts. 'Logic Mapping' places a great deal of emphasis on identifying clear 'Objective Verifiable Indicators (OVI's) and Means Of Verification (MOV) models to ensure that what is expected to happen is tracked and reported on. As with other planning models 'Log Frames' can have the danger that they are sometimes rather rigidly applied and so stifle the opportunity to react to changes in circumstances outside the programme plan.

In contrast to the 'Log Frame' approach Social Marketing, which seeks to apply marketing theory and practice to social causes used a systematic but reflexive approach to programme planning. Social Marketing is underpinned by a number of similar planning

[313] For a good general guide to Logic Models see: http://www.wkkf.org/knowledge-center/resources/2006/02/WK-Kellogg-Foundation-Logic-Model-Development-Guide.aspx

concepts to the other models mentioned above but it also contains a number of distinctive additional features. Social Marketing is distinct among the models outlined above in that it's criteria for success rest on measurable behavioural change. Indicators, such as increased awareness and understanding are only used as process tracking mechanisms, observable or reported behaviour change being its 'bottom line' indicator. The Social Marketing approach is based on a number of particular if not unique principles that have been expressed in the UK as a set of government endorsed planning benchmark criteria for social change programmes.[314] These planning principles include a focus on:

1: Insight Driven Programme Development

Social marketing is based on the development of a deep 'insight' into people's lives, with a clear focus on what will and will not move, motivate or enable people to change in any given situation. Insight drills down from a wide understanding of the 'customer orientation' to focus on identifying key factors and issues relevant to influencing a particular behaviour. The approach is focused on identifying and developing 'actionable insights' based on all available relevant data to make considered judgments about what will help. These insights are subsequently tested through pilots and refined or rejected according to their utility.

2: Exchange and Choice Architecture

Consists of understanding and developing interventions that make it more likely that people will adopt a particular behaviour. This core concept involves developing one of three approaches or a combination of them:

1. A compelling positive 'exchange' proposition based on customer analysis, is what a person will perceive as a value that outweighs the cost of change, i.e. an incentive based approach.
2. The development of a system, service or product that assists or 'nudges' a person voluntarily towards a socially beneficial behaviour.
3. The development of a system, service or product that requires a person to behave in a particular way or face a negative consequence i.e. a disincentive.

3: Competition analysis and action

A robust competition analysis is a key principle of social marketing programmes. Competition analysis examines both internal and external competition that restrict or stop the desired behaviour form happening, this then leads to strategies being developed to address these forces. Both internal and external competition analysis is undertaken

- Internal competition (e.g. psychological factors, pleasure, desire, risk taking, and addiction)

- External competition (e.g. wider influences and influencers competing for the audience's attention, time, and behaviour, promoting and reinforcing alternative or counter behaviours)

4: Behavioural Goals

Social Marketing has a clear focus for achieving impact on people's behaviour, and is based on the setting out of SMART behavioural goals. A broad behavioural analysis is undertaken to develop a rounded picture of the current behavioural patterns and trends, making sure to examine both, the 'problem behaviour'; and the 'desired behaviour'. Interventions are then developed to focus on specific behaviours (going beyond just focusing on addressing information, knowledge, attitudes, and beliefs).Interventions seek to address four key behavioural issues not just the 'behaviour change':

[314] National Social Marketing Centre Social Marketing Benchmark Criteria. French J. Blair-Stevens C. 2007.

1 *Formulation and establishment of the behaviour*—understanding what helps trigger and establish the behaviour in the first place (making sure to look at both the problem and the desired behaviour)

2 *Maintenance and reinforcement of the behaviour*—understanding and sustaining the behaviour over time (again making sure to look at both the problem and the desired behaviour)

3 *Behavioural change* - understanding what will move and motivate or assist people to make changes and what barriers need to be addressed.

4 *Behavioural controls*—understanding where voluntary approaches may not work and where ethical criteria can justify the use of requirements or controls to influence the behaviour in the given context.

Social Marketing is also distinguished by its explicit embrace of theory. Theory drawn from many disciplines to inform and steer the development of programmes. Theory is used to inform and guide development, with theoretical assumptions being tested as part of the developmental process. An open integrated theory approach is applied to systematically examine which form of theory offers the greatest utility in a given context, while avoiding the tendency to simply apply the same 'preferred' theory to every situation and context.

5: Segmentation

Social Marketing applies a segmentation approach, going beyond demographic and where relevant epidemiological and service uptake data by adding data about peoples beliefs, attitudes, understanding and behaviours. Target audiences are segmented using this data into sub sets that share common beliefs, attitudes and behaviours. Interventions are directly tailored to specific audience segments rather than relying on 'blanket' 'spray and pray' approaches.

6: Methods mix

Social Marketing examines and uses an appropriate mix of methods to achieve the goals of the programme. A range of different types of intervention are examined and used to establish the most effective, efficient and cost effective mix of methods:

- Educate, to enable and empower.
- Support, to serve and practically assist.
- Design, to alter: environment, systems, products, services.
- Control, to require, regulate and enforce.
- Inform, to communicate facts and attitudes.

Each of these types can be overlaid with intervention forms that focus on delivering positive or negative reinforcement and also focus on either rational cognition or interventions designed to influence rapid cognition or what was described in section seven of this paper as 'mindless choosing'.

7: Systematic and Reflexive Planning

Social Marketing interventions are characterised by extensive planning and the development of Social Marketing plans. There are a variety of different planning models but they all tend to include a focus on what is often called, scoping. Scoping involves bringing together behavioural theory, evidence of what has worked to influence behaviour and insight about what will influence target audiences. Social Marketing planning models all include a pre-testing and development phase to prototype interventions before full scale delivery. Social Marketing implementation planning is reflexive e.g. it is designed to track the efficiency and effectiveness as programmes are delivered and allow for refinement as projects proceed. All planning models also include strong elements of evaluation, quality assurance and feedback of learning to further improve subsequent programmes.

The Evidence for Social Marketing

There is a growing body of evidence that indicates that Social Marketing can be an effective approach to behaviour change in the health sector. [315] [316] For example, the recent CDC review of Social Marketing, [317] the CDC Task Force findings and recommendations which derive from the comprehensive review methodology of the CDC Community Guide programme identified what they term "strong evidence of effectiveness for producing intended behaviour changes. The Community Preventive Services Task Force recommended that health communication campaigns that use multiple channels, one of which must be mass media, combined with the distribution of free or reduced-price *health-related products* showed that programmes:

- Facilitate adoption and/or maintenance of health-promoting behaviours (i.e., increased physical activity through pedometer distribution combined with walking campaigns).
- Facilitate and/or help to sustain cessation of harmful behaviours (i.e. smoking cessation through free or reduced cost over-the-counter nicotine replacement therapy [OTC NRT]).
- Protect against behaviour-related disease or injury (i.e. condoms, child safety seats, recreational safety helmets, sun-protection products).

The review also noted: 'Because results were positive across all the health behaviours evaluated, these findings are likely to apply to a broader range of *health-related programmes*. The systematic review focused, however, only on interventions that included a mass media component; therefore the results may or may not apply to campaigns that do not include a mass media component.

There is a growing evidence base that Social Marketing focused on the prevention and control of communicable disease,[318] further endorsement for adopting a Social Marketing approach to planning and delivery of effective behavioural programmes in the health sector comes from the new WHO Europe Health Strategy [319] which endorses the use of Social Marketing as part of the recommended approach to health policy. In addition the recently

[315] Gordon R, McDermott L, Stead M and Angus K (2006). The effectiveness of social marketing interventions for health improvement: What's the evidence? *Public Health*, **120**: 1133-1139

[316] Stead M, Gordon R, Angus K and McDermott L (2007). A systematic review of social marketing effectiveness. *Health Education*, **107**(2): 126-140.

[317] CDC Health Communication & Social Marketing: Health Communication Campaigns That includes Mass Media and Health Related Product Distribution. http://www.thecommunityguide.org/healthcommunication/campaigns.html

[318] National Consumer Council French J Mau E. It's Our Health 2006. NCC London.

[319] WHO Health 2020 The European Policy Framework on Health and Wellbeing http://www.euro.who.int/en/what-we-do/health-topics/health-policy/health-2020. 2012

published ECDC commissioned review of Social Marketing for the prevention and control of communicable disease [320] states:

> *'The European evidence is limited, but promising, with social marketing principles having been successfully applied in hand hygiene and sexual health interventions…. The evidence indicates that audience-informed intervention design and development, partnership-based interventions, and sharing of lessons learnt from previous practice can enhance effectiveness of social marketing for communicable disease prevention and control'*

Understanding from Generic Health Sector Planning

In addition to understanding from health promotion and health focused Social Marketing there is also a great deal of evidence re- effective planning and implementation management for the health sector itself as many health service systems clearly include behavioural components such as attendance at clinics and compliance with recommended medications or specific behaviours such as rehabilitation focused exercise. Perhaps the most comprehensive analysis of successful health service criteria has been undertaken by Klassen et al in 2010[321]. This review analysed thousands of papers and nearly 600 full text papers involved in a review of core quality criteria for successful delivery of health services. The authors highlight five key themes for performance measurement and improving service delivery:

- Collaboration.
- Learning and innovation.
- Management.
- Service provision excellence.
- Outcome focus.

These themes and findings from Klassen et al echo the findings from previous research but offer additional insight into the complexity of establishing criteria or guidelines for the development, delivery and evaluation of health interventions, including pandemic management and preparation. The wide scope of factors feeding into each theme demonstrates that numerous variables are involved; this clearly has implications for the need to be guided by such criteria but also the need to exercise judgement depending on the particular circumstance of individual countries and regions.

A further consideration that builds on the issue of collaboration highlighted by Klassen et al is the issue of integration and co-ordination of service delivery. Suter et al[322] set out in 2009 a set of key principles based on a comprehensive systematic review of health literature focused on key principles for improving integration and co-ordination of service delivery. Suter et al highlight the importance of patient focus, maximising access and exposure to services, the need for standardised quality assurance and performance managed delivery backed by accurate information systems. They also indicated that strong markers of success include a strong organisational culture of leadership and sound financial planning.

The work of Suter is helpful when looking at performance management as the authors focus is on quality issues and ensuring that outcomes are clearly defined and measured appropriately. Information from outcome measures can then be used to improve service

[320] [320] MacDonald L, Cairns G, Angus K, Stead M. Evidence review: social marketing for the prevention and control of communicable disease. Stockholm: ECDC; 2012.
[321] Klassen A et al (2010) Performance measurement and improvement frameworks in health, education and social service. A systematic review. International Journal for Quality of Health Care. 22(1) 44-69.
[322] Suter E et al (2009) Introduction to integration. Then key principles for successful health systems integration. Health Care Quarterly. 13 (Sp) 2009. 16-23.

performance and delivery. This kind of virtuous circle of improved performance is a key learning point for improving systems approaches to pandemic management. One clear implication is the maintenance of on-going review mechanisms of performance at local, national, regional and global level.

A final issue to consider with regard to learning from generic health systems planning, management and performance that can be applied to communication and marketing planning with direct significance for pandemic event preparation and management is the issue of prioritisation of effort. Priority setting is clearly a key issue in managing any infectious disease public health scenario. To understand how health service managers establish priorities Gibson, Martin and Singer [323] interviewed health service decision makers to determine their priorities and how these were applied. The key criteria identified are set out in the following table:

Table: Key Principles for Service Success

I. Strategic fit

a. Clinical services contribute to advancing the strategic directions of the organization.

b. Key driver in operational planning.

II. Alignment with external directives

a. Government directives/policy.

b. Regional versus national initiatives.

III. Academic/Education Commitments

a. Integrating education of future healthcare professionals with health service delivery.

b. Research to further best practice standards.

c. Innovation.

IV. Clinical Impact.

a. Service volume necessary to ensure clinical competence of medical staff to provide safe and effective care.

b. Quality of service.

c. Uniqueness of health service for local area.

V. Community Needs

a. Regional and local patient needs.

b. Service demand (utilization rates, waiting times).

VI. Partnerships (External)

a. Co-ordinating care delivery with external partners.

b. Enhance service quality and resource utilisation.

VII. Interdependency (Internal)

a. Co-ordination and collaboration across clinical services..

b. Enhance service equality.

[323] Gibson L Martin S Siger D (2004) Setting priorities in health care organisations. Criteria processes and parameters. BMC Health Service Research. 4 25-33.

c. Quality of work life factors are key enablers.

VIII. Resource Implications

a. Mobilisation and use of human and fiscal resources.

The criteria identified in the table above clearly have a great deal in common with the criteria and key features identified by Klassen and Suter and the Social Marketing planning models outlined above. It would appear then that the core principles of successful planning applied by health systems and services managers and service providers are reasonably consistent and are closely matched with what most organisations would consider to be principles of sound planning and management.

In terms of developing successful behavioural influence programmes it is clear that these characteristics are also important and the more that are present the greater the probability of success.

Conclusions

In summary the literature concerned with service and behavioural change planning and management provides a reasonably tight consensus on the importance of the application of core sets of planning principles. They set out clear aims and objectives, a development phase that includes gathering theory and data about the problem, clear identification and understanding of target audiences, piloting, pretesting and programme refinement and robust management monitoring and evaluation of programme implementation. However, the existence of planning templates is not sufficient to ensure the delivery of effective and efficient programmes.

Other factors such as the need for appropriate leadership, well trained and supported staff and systems for learning and review are also important. Taken together with the planning elements set out above these principles can be used to create a planning and performance culture which can lead to more efficient and effective behavioural programme performance and ultimately better outcomes in terms of outbreak management and service provision to the public and specific patients.

However, public health programmes especially those associated with pandemic events are complex and often fast moving. In many less dynamic health and disease topics, the intervention and the expected outcomes of the intervention can be specifically stated and the processes that will be tested for efficiency and effectiveness can be closely defined before implementation. Trials can be conducted in a controlled way that can give reasonably high levels of assurance that there is a causal link between intervention and population behaviour change and or impact on the targeted disease. In such interventions intended markers of success can be outlined in a set of clear, measurable, numerical indicators. However, for obvious reasons when dealing with dynamic human populations where all possible variables cannot be controlled and when the nature of the behaviour that is being suggested may change rapidly such an ideas approach is not at all easy to deliver methodologically.

There are valid arguments that preventive and health promotion interventions should be as concerned with having an impact on the social determinants of health and disease as much as seeking to influence individual behaviour change. Adopting this more holistic approach

means it is clearly more difficult to identify all the independent variables[324]. Green warns that if there is not an adequate understanding of a problem, then health promoters may identify the wrong independent variables or address only a proportion of them, meaning that intervention programmes will be less likely to achieve their overall aims[325]. What this means for programme planning in relation to behavioural influence associated with pandemic events is that in addition to the application, in a systematic way, as of many of the good planning principles set out in this section of the paper practitioners and planner also need to develop plans for a variety of scenarios and also develop plans that focus on both assisting with outbreak management but also programmes targeted at building community resilience during times of low threat.

It is also clear that despite there being a number of logical well-constructed planning models for behaviour change within the public health field there is a need to encourage a more comprehensive application of these models in practice. This is necessary for reasons of both better delivery but also because it will help to improve the capture and dissemination of what works and what does not and what intervention approaches are more efficient than others. There also appears to be a need for more training in the use of these planning models and the need to develop simpler more user friendly starter models that may encourage adoption. The Proto Tools developed in this and other E-Com work streams will aid this process and the dissemination of these tools in the final stage of this project will also, hopefully make a contribution to this current problem.

The following two Proto Tools can be used to assess the potential weaknesses and strengths of behavioural influence programme plans:

[324] Koelen M, Vaandrager L, Colomer C. Health promotion research: dilemmas and challenges. J Epidemiol Community Health. 2001 Apr,55(4):257-62
[325] Green J. The Role of Theory in Evidence-Based Health Promotion Practice. Health Educ. Res. 2000 Jan 4;15(2):125-9

Proto Tool 11

Common Programme Planning and Weaknesses Check List.

The following check list can be used to assess the existence of common weaknesses in planed programmes designed to influence behaviour in relation to pandemic events. If the programme exhibits one or more of the elements set out below remedial action will need to be put in place to lessen or remove the impact of the weakness.

Characteristic	Indicate if and how the characteristic is present in the current plans	Set out possible mediating actions
Programme constructed by experts and policy planners only.		
The programmes aims and objectives are non-specific.		
Citizen insight research has not been used to define target groups and approach.		
The programme has not made use of theory, evidence and or data to inform its planning.		
The programme has not developed a strong business case for the allocated or proposed budget.		
A weak or incomplete situational analysis has been completed of influencing factors.		
The programme does not have a sufficient time scale to achieve its objectives.		

The programme is a short-term campaign and will not be evaluated in terms if target audience behaviour change.		
The programme does not have a clear and robust performance management system.		
Little or no evidence of plans and resources to ensure widespread stakeholder engagement can be delivered and maintained.		
A review mechanism is not in place to ensure that the programme messages and approach are refreshed on a regular basis.		
The programme has weak mechanisms to co-ordinate efforts within the originating country and with relevant organisations at a European level.		
The programme cannot demonstrate that it has human resource systems in place that will ensure that programme staff are trained and supported to deliver the programme.		
The programme uses a limited intervention mix of approaches		
Ethical issues have not been addressed and clearances, approval obtained.		

Proto Tool 12

Checklist for Assessing the Strength of Planning for a Behavioural Intervention

CHARACTERISTIC	YES	NO	UNSURE	COMMENTS
1. CAMPAIGN GOALS/OUTCOMES: Specific, actionable, and measurable behavioural goals have been set that use a SMART format.				
2. CAMPAIGN RATIONALE: Presence of a clear rationale and need for the campaign and why particular interventions have been selected.				
3. SITUATIONAL ANALYSIS: Systematic scoping has been done to analyse environment, social, technological, economic and legal perspective. All relevant data, evidence and experience of the issue has been gathered to inform planning.				
4. FORMATIVE AUDIENCE RESEARCH: Evidence of primary or secondary formative research, including, audience knowledge, attitudes, practices, and behaviours in relation to topic area.				
5. BEHAVIOURAL THEORY: Behaviour change model/s and theory has been used to segment/target the audience and inform the intervention.				
6. STRATEGIC PLANNING: The intervention has clear written systematic, short, medium and long-term plans that are endorsed by stakeholders programme staff and target audiences.				
7. BUDGET: The recommended budget is based on a full business case and is adequate to achieve the objectives of the intervention over the required time frame.				
8. PRE-TEST/MONITORING RESEARCH: Intervention has been developed pretested and monitored with the target audience and stakeholder involvement.				

9. EXCHANGE and VALUE: Analysis has been completed of what audiences value and what the target audience has to give up (e.g., financial, physical, time-related costs) to get the benefits or value proposed, and this is built into the intervention approach. (E.g. Incentives, recognition, reward, and/or disincentives are built in) Consideration of the use of products, services and messages that deliver value has been completed.				
10. COMPETITION & BARRIERS TO CHANGE: Factors competing with the desired behaviour are considered and addressed (e.g., environment, economic factors, psychological, media/consumer-related factors, physiological factors such as addiction, etc.).				
11. INTERVENTION MIX: An integrated approach is evidenced by the presence of a valued 'proposition' product or service to the target audience that is offered and promoted through a co-ordinated approach to information, education, service design and execution, and supported by systems and policy. Interventions may involve both active and passive decision making.				
12. STAKEHOLDER ENGAGEMENT AND MANAGEMENT: Presence of mechanisms for on-going stakeholder relationship development is evident - including internal/external stakeholders, partners, sponsors, allied organizations interest groups, communication and management.				
13. ETHICS: The ethical implications of the plan are clear, and the programme is designed in such a way to address relevant issues. All necessary and appropriate ethical approvals have been obtained.				
14. MONITORING/EVALUATION FRAMEWORK: Short, medium, and long-term evaluation plans are in place to track process impact and outcome results.				
15. ACTIVE DISSEMINATION: Plans are clear for disseminating the results and ensuring learning is fed into the development of future interventions.				
16. SKILLED & SUPPORTED STAFF: The Programme is staffed by experienced people who have high level commissioning, planning management and evaluation skills. There are staff review and development systems in place. Programme leadership is robust and well regarded.				

Conclusions

This paper has reviewed a great deal of material related to behaviour change and communication and how this can be applied by public health agencies and governments attempting to prepare for and manage pandemic events.

Those responsible for guiding and delivering marketing and communications activities as part of pandemic events are well aware that many programmes are not as well developed as they could be and regularly seek to improve practice. Current programmes are often focused on individual campaign-specific activity, rather than sustained marketing activity as an integral part of a long-term public health policy process. Often those responsible for delivering communications and marketing programmes are constrained by the financial and structural barriers and practices they are forced to employ.

The final section sets out a number of key messages or conclusions and some recommendations for improving practice in relation to behavioural influencing programmes based on the material reviewed for this report about how public health agencies and governments could work to be more effective in their public health marketing and communication functions. These recommendations take account of the broad diversity across Europe, the barriers many agencies face and how we can do things differently.

We are aware that some of the issues we have identified in this review echo what many agencies and governments have already discovered during their own reviews of communications and marketing capability, capacity and management.

A Time of Change

The current economic situation across Europe is a potential key driver for some radical thinking and reassessment of what represents good value for money in pandemic preparedness. In tough economic times there is a need for more economic evaluation of public health interventions alongside effectiveness and efficiency evaluations. There are other factors that represent significant drivers for a reassessment of current investment that include a greater understanding of the role and limitations of communication strategies in pandemic events and a growing body of understanding about new ways to influence attitudes and behaviour. These challenges are arising because many current recommended approaches such as policy interventions based on communicating risk are not only not universally and effectively delivered but also because that while such forms of intervention may be a useful part of an overall approach there may well be the need for them to be augmented by some of the emerging new thinking around behavior and how it can be influenced coming from economics social psychology and other related fields of study. There may well be a need to develop a new narrative that reflects both current evidence about effective practice but one that also incorporates new evidence, emerging new ideas and the current and likely future environment in which these programmes including the new digital information environment.

This paper makes it clear that there is not a single or simple approach to influencing behaviour that can be applied across all those behaviours that practitioners and policy makers may wish to influence prior to, during and in the aftermath of a pandemic event. This paper has also demonstrated the obvious point that behaviours and what influences them are complex. As a consequence developing a detailed understanding from a theoretical perspective which then leads to the development of a particular behavioural intervention approach which then leads to the development of a systematic and staged plan detailing all aspects of an intervention and how it will be evaluated is a complex and time-consuming exercise. This complexity results in many practitioners, public health organisations and

agencies failing to complete all of these key steps. A further consequence of this sub-optimal planning is that there are not many examples of thoroughly developed plans or many high quality intervention programmes that have been published. The consequential weak evidence base this produces leads to a continuation of sub-optimal intervention delivery.

Where more comprehensive behavioural change plans and even communication plans are developed there focus is often limited to particular pandemic behaviours or awareness issues with little synergy being generated between other related public health policy areas such as poverty and inequality and little recognition of the benefits to be realized in cross-sector approaches e.g. joining up the health, environment and spatial determinants agenda (such as in the model of social determinants developed by Barton & Grant, 2006[326]).

As seen in section four there is a lack of evidence or only limited positive evaluation for some single approach social advertising, education and information based interventions. However, such interventions still form a key part, if not the dominant part of many government strategies. It is probable and desirable that information transmission interventions will form part of all policy responses because governments rightly feel they have a duty to inform and educate citizens. The contribution that these forms of intervention deliver should be recognised, but positioned as part of an integrated and comprehensive approach. As seen in section four, evidence indicates that programmes that use multiple elements tend to be more effective than those that depend on information transmission alone.

The Core Findings of This Paper

The complex behaviour challenges associated with pandemic events highlight the limits of conventional communication approaches.

Well researched, well planned and targeted communications programmes are a vital part of all pandemic management and control intervention programmes. However, the tendency to rely on simplistic information transmission and processing models of influence can reduce the impact of these programmes. Some of the new social policy and heath tools that behavioural scientists and others working in the field of behaviour influence have developed based on a growing body of behavioural research summarised in books such as; *Thinking Fast and Thinking slow*[327], *Nudge*[328] and *Influence*[329] have generated a lot of interest amongst many policy makers and planners in government health sector organisations. This new work confirms and makes accessible the understanding that a much wider range of human motivations exist that just rational self-interest based on logical information processing. This new understanding makes clear the need for strategies of influence that go beyond the transmission of factually accurate logical information as the main way to influence behaviour and opinion prior to, during and after pandemic events.

Multiple interventions are more successful. The effectiveness of single interventions in isolation does not appear to be as great as combining ones that impact on conscious decision making and decisions that are influenced by other mental processes and external factors such as social norms and incentives. Economic instruments can provide the stimulus

[326] Barton, H. and Grant, M. (2006) A health map for the local human habitat. *Journal for the Royal Society for the Promotion of Health* **126**:6 , pp. 252-253
[327] Kahneman D, Thinking fast and thinking slow Macmillan. 2011.
[328] Thaler R & Sunstein C, *Nudge: Improving decisions about health, wealth and happiness,* Penguin 2009
[329] N. Goldstein; S. Martin; R. Cialdini. *Yes! 50 Secrets from the Science of Persuasion*, Profile Books 2007

for change with communication and choice editing shaping successful uptake. (See separate report under Work Programme 3 focused on incentives)

Humans are not entirely rational when making health choices and this understanding needs to be reflected in pandemic programmes. We do not simply decide on the basis of well-presented information to act in way that demonstrates that they have carefully considered the costs and benefits of an action and then selected the option that results in maximum personal or family benefit. Instead, there are numerous internal and external influences on an individual's behaviour that need to be considered and influenced. If we are to influence health behaviour we need to apply a more sophisticated approach to understanding and developing more comprehensive strategies to influence behaviour that include, but go beyond the transmission of scientifically accurate information to include influencing strategies that target non rational choice. There are clearly considerable ethical issues associated with such approaches that will need to be considered.

Behavioural models and theory can help strengthen the development delivery and evaluation of pandemic communication and behavioural programmes. One of the tentative conclusions that can be drawn from this review is that theories intended to modify individual level behaviours remain the most commonly applied in pandemic events. Policy and training interventions could be developed to broaden this focus to include ecological theory and models to guide research, intervention design and evaluation. When constructing behavioural interventions the use of several theories and models appears to assist with identifying the key elements which are of most use in either explaining the behaviour or predicting what will influence change. This understanding can be used as the foundation around which communications and messaging can be designed, and other forms and types of influence developed. This is the approach Darnton recommends to policymakers [330]. There will be occasions however, when existing behavioural theory is not available or appropriate. In these circumstances it will be necessary to use existing theory and models to build a behavioural framework from scratch to inform programme planning design and evaluation.

It is not sufficient to consider an individual's voluntary behaviour change in isolation. The impact of social, economic and environmental factors have a large influence on people's ability to behave in certain ways and their motivation to do so. The behaviour of others and the general cultural and social environments expressed though notions of social capital and community resilience also needs to be considered and often targeted if individuals are to be helped to sustain a positive behaviour or modify a less healthy behaviour. The role of communication and other forms of behavioural influence such as nudging outlined in this paper focus mainly on changing 'voluntary' behaviour, rather than enforcing behaviour change. However, governments supported by public health institutions in some pandemic situations will need to use tools to 'enforce' rather than encourage behaviour change. **It** needs to be recognised that when the health threat is great governments may need to use different tools to influence people to become compliant including incentives and or sanctions. The use of such tools will also need to be accompanied by communication and behaviour change programmes that seek to engage, explain and involve people in the execution of such non-voluntary change interventions such as fines or restrictions of movement or assembly.

[330] Darnton 2008 op.cit.

Recommendations

Citizen[331] Focused Solutions.

If the outcome of pandemic communication and behavioural influencing strategies is to achieve a positive, accurate and trusted understanding and experience of government policies related to pandemic management and compliance with recommended actions the approach must be to move away from a top down one way communication dominated model. We need to move towards a model that is based on customer needs, dialogue and feedback with people we seek to influence and an approach that is responsive to demands and changing circumstances. We also need an approach that is focused more on impact and outcome measurement in terms of actual behaviour.

This approach will require a level of sophistication in planning and delivery that goes beyond the traditional 'press handling and a paid publicity' approach. A new approach that is more strategic, joined-up and customer centric and customer sensitive will be required. Given current political imperatives associated with more active citizen engagement there is a good case for a more citizen focused approach to developing policy guidance related to pandemic events. Most citizens do not compartmentalize their reactions or behaviour to infectious disease threats in the way that public health programmes often do. A citizen-focused approach would mean talking about health behaviour and tackling issues in a more citizen centric rather than expert or disease centric way. For example, combining work on hand washing as a part of personal hygiene and grooming rather than something related to pandemic events. Such an approach would result in building intervention strategies around a deep understanding of people's existing attitudes and beliefs rather than single behaviours or discreet clusters of behaviours related to risk factors associated with pandemic events as specified by experts

Public Permission Matters.

The concept of Public Permission as defined by the UK Government MINDSPACE [332] review is based on earlier work of Gummesson and Gronroos [333] [334] [335] on relationship marketing. This European developed view of marketing has had a direct influence on the development of social marketing. Relationship marketing moves away from an influencing strategy focused on external persuasion towards a strategy based on a relationship of mutual respect and dialogue. This concept has been further developed by Godin [336] as 'Permission Marketing', which is about seeking people's permission to engage with them, make offers and suggestions of help for them or offers of products or services they may be interested in. When what is known about non-cognitive decision making is combined with this relationship development approach as stated above, many ethical issues are raised about subtle influence that may not be recognised by citizens. The more powerful and subtle behavioural change approaches are, the more they may provoke public and political concern. Behavioural approaches that embody a line of thinking that moves from the idea of an autonomous individual making rational decisions to a decision-maker, much of whose behaviour is automatic and influenced by their choice environment, raises the question of

[331] We use the term 'citizen' to indicate members of the public, the exact word to be used will need to be considered in the light of debate resolution in relation to the issues raised in section two of this paper.
[332] Dolan P, Hallsworth M, Halpern D, Kind D, Vlaev I. Mindspace, influencing behaviour through public policy. Full Report Cabinet Office. Institute for Government. London2010

[333] Gummesson, E. (1987) 'The New Marketing—Developing Long Term Interactive Relationships', Long Range Planning, 20(4), 10–20.
[334] Gummesson, E. (2002) Total Relationship Marketing. Rethinking Marketing Management: From 4Ps to 30Rs (2nd edn), Butterworth Heinemann, Oxford.
[335] Grönroos, C. (2007) Service Management and Marketing: Customer Management in Service Competition (3rd edn), John Wiley & Sons, Chichester.
[336] Godin, Seth (1999).*Permission marketing: turning strangers into friends, and friends into customers*. New York: Simon & Schuster.

who decides on and who can influence this choice environment? One of the key challenges that will face public health planners who seek to use no-rational approaches and approaches that seek to build relationship influence is how the permission to use these approaches will be given and legitimised in order that a backlash of public opinion does not result in accusations of trickery and manipulation.

The advances in understanding and methodological development in the field of systematic health programmes and behaviour change planning need to be better integrated into pandemic communication and behavioural influence programme management.

As discussed in previous sections of this paper the development of more systematic approach to health behaviour change [337] and a growing body of research[338] that goes beyond communication theory [339] has been developing over recent years[340] [341]. Intervention forms such as social marketing[342], co-creation[343] and community engagement[344] are examples of these new forms of social policy delivery. This development along with more general improvement in social policy implementation[345] planning[346] has resulted in a growing consensus about how to go about establishing, delivering and evaluating more successful behavioural programmes in the social sector. This understanding should be used to shape intervention programmes. There is a need to ensure that policy makers and politicians are aware of what us currently known about influencing behaviour and how to design and deliver an effective intervention.

Evidence driven but not evidence restricted.

It is probable that governments and public health agencies will always use some forms and types of intervention that are not fully supported by strong evidence. Interventions such as social advertising should not be dismissed as ineffective, rather government and public health organisations should ensure that they apply best practice when developing these forms of intervention. A culture of systematic planning and evaluation should be encouraged to enable transparent reporting on the impact and efficiency of all programmes. This will help with developing the evidence base[347] for communication and behaviour change interventions in the field of pandemic management. The use of pilot testing should also feature in all programmes.

Cultural and organisational issues, the status of communication and marketing.

Behavioural influence and communications often exists as a bolted on adjunct (all be it a vital one) to the influence of medical and epidemiological understanding in the policy development and strategy development process. Communication and those responsible for

[337] Michie S , M van Stralen M ,West R. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implement Sci. 2011; 6: 42. Published online 2011 April 23.
[338] CDC The Community Guide. What works to promote health? http://www.thecommunityguide.org/worksite/supportingmaterials/IES-AHRFAlone.html. CDC Atlanta.
[339] McQuaid D Mass Communication 5th edition Theory Sage 2009
[340] National Institute for Health and Clinical Excellence (2007) Behaviour change at population, community and individual levels. Reference Guide. London: NICE
[341] It's our health. National Consumer Council. 2006
[342] French J. Blair- Stevens C. Merritt R. McVey D. Social Marketing and Public health, theory and practice. Oxford University Press 2010

[343] Cottam, H . Leadbeater, C. Red Paper No1 health: Co-creating Services.The Design Council. London. 2004.
[344] Hills D. 2004 Evaluation of community – level interventions for health improvement: a review of experience in the UK. . HDA. London.
[345] Good Government. Public Administration Select Committee. (2009) House of Commons London: The Stationery Office Ltd
[346] Australian Public Service Commission (2007) Changing Behaviour a public policy perspective. Australian Public service Commission. Barton, ACT: Australian Government Publishers Ltd. 2009.

[347] Applying behavioural insight to health. Cabinet Office Behavioral Insight Team London.2011

influencing behaviour in relevant organisations often operates in an environment where messages and policies are developed prior to and independently from a marketing and communications strategy. This often leads to a producer-led selling approach, i.e. a focus on broadcasting evidence based messages about risk reduction and communication focused on compliance with medical opinion.

A significant cultural and technical shift is required within governments and specialist responsible agencies to a more customer-led marketing approach, and a fully integrated partnership between marketing and communications professionals and policy and delivery professionals. The implications of adopting such an approach would include:

- *Ensure marketing is brought in to policy development as early as possible. It should act as the voice of the citizen when the policy and programme are being developed.*

- *Embed a neutral stance regarding how to influence people among all participants including policy officials and ministers during the initial planning stage. Too often there is a leap to a solution, usually involving advertising, without consideration of all the other options or combinations of types and forms of intervention to achieve the objective.*

- *Marketing and communications staff should be positioned to act as the voice of the consumer when the policy and programme are being developed via a responsibility to gather and interpret citizen data on attitudes, beliefs and behaviours.*

Capacity and Capability.

Marketing practitioners in many governments across Europe have excellent technical skills, but there are many countries where this capacity is not so well developed. There is a need to continue to build and sustain a high-level of professional capacity and the marketing and communication professional community will need to have the skill-set that will enable them to engage in policy development as well as programme delivery and evaluation if marketing and communications is to be more strategically engaged in pandemic preparedness policy formulation. The implications of adopting such an approach could include countries undertaking a marketing and communications capacity and skills audit and the development of an assistance programme to develop training courses and mechanisms for sharing of best practice and skills and other competences for example, influencing policy makers, stakeholder management and leadership skills.

Budgets and other assets.

All EU countries hold and deploy their own resources alongside neighbouring countries and also the efforts of international regional organisations such as ECDC, CDC, WHO. Annual budget allocations can fuel short-termism. Budgets are also often allocated as a single entity rather than being divided between development, piloting, execution and evaluation. Ideally budgets should be allocated to cover the complete timescale for the planned activity and should be justified not only in terms of achieving quantified objectives and in terms of programme delivery, but also how the activity will contribute to the overall strategy as a whole. The possibility of cross boarder alignment of marketing and communication resources should be investigated to ensure that budget management is optimal.

Silo research and evaluation.

There are no current reliable estimates for how much is spent on marketing and communications research in the field of pandemic preparedness and management across Europe. However, it is reasonable to conclude given the size and importance of the issue to governments that the aggregate figure is significant. Most of this research is commissioned for individual agency programmes rather than for the European common good. The implications of adopting such an approach would include:

- Closer liaison and co-ordination with medical, epidemiological, social and marketing and communications research to inform both policy development and communication planning and evaluation.

- Initiate more centrally/ joint-funded marketing and communications research projects to minimise overlaps and maximise strategic joined up opportunities. ECDC and WHO are obvious agencies to take on this role.

- Use 'upstream' horizon scanning and developmental research to pro-actively set the strategic marketing and communications agenda across European countries and specialist agencies.

- Develop standardised procedures for evaluative research to demonstrate the effect of pandemic marketing and communications programmes with the public but also inter and internal organisational communications programmes. This research should develop protocols for process measures of campaign efficiency, impact evaluation i.e. short term change such as awareness, as well outcome measures such as behaviour change or compliance.

Proto Tools

The final two Proto Tools set out in this section of the paper are aimed at senior responsible officers and Politician's.

Proto Tool 13 is intended to be used as a set of guidance questions based on a set of good practice principles that can be used to interrogate plans that are proposed by communication marketing and public health officials regarding behaviour change programmes. Proto Tool 14 draws on what is known about the importance of engaging communities and stakeholders as well as the need in programme planning terms to develop stake holder management planning. Proto Tool 14 is a check list that can be used to ensure that relevant stakeholders, partners and target communities have been engaged in the development of interventions and will be engaged in delivery and evaluation in an appropriate way.

Proto Tool 13

Senior Responsible Officer Review Checklist

1. **Behaviour change programmes need long-term strategic planning. You should seek to ascertain if the proposed programme includes**:

- Plans and strategies to integrate and align policy, strategy, delivery.
- Communications, setting objectives against which to evaluate success.
- Selecting an appropriate mix of interventions.
- Longer-term and robust budget allocation process.
- Principles of good impact assessment, such as setting clear objectives, considering a range of outcomes and estimating the likely costs and benefits.

2. **You should be provided with evidence of understanding and insight into the factors that will motivate different segments of the target population to change their behaviour or sustain a positive behaviour through the proposed programme.**

Generating insight into the motivations, influencers, understanding, attitudes and behaviours of target audiences is a key to success. Segmentation of an audience recognises the diverse needs of different groups and allows for targeting of interventions based on what different people really need and want.

Segmenting on the basis of not just geography, demographics and socio-economic factors but also attitudes, lifestyle and life stages, understanding, beliefs, values and behaviour will inform a more effective targeting for the behaviour change programmes.

Officials should be able to provide you with information about which theories and models of behaviour have been used to shape the proposed interventions. Officials should also be able to demonstrate that they have carried out a thorough situational analysis that considers social, political, economic, technological and legal issues and a strengths and weaknesses assessment of current and proposed plans.

3. **Have you been assured that all existing evidence and insight relevant to the behaviour change and target audience across government has been brought together before you authorise any new research to be conducted?** Identify opportunities for joint interventions to target the same audiences. Make sure insight informs the behaviour change programme from planning through to evaluation. Ensure that any new data that is captured is shared as widely as possible with relevant stakeholders and partners.

4. ***Working together and reducing duplication of effort.***
Value for money can be improved by greater joint working between departments and other national regional, European and International and local public health bodies. Ask for details of joint working, stakeholder management plans and plans to form and manage coalitions to tackle the threat (See Proto Tool 14). Greater leverage can also be gained by identifying partners in the private and voluntary sectors to support behaviour change interventions. (For example, the Department of Health Flu vaccination team has formed partnerships with the British Lung Foundation and

various other voluntary organisations to use their expertise in targeting 'at risk' groups).

5. ***Are you clear that the evaluation model proposed is robust and appropriate?*** Behaviour change programmes are best evaluated against a range of measures from longer term shifts in eventual outcomes and observed behaviour and short to medium term indicators of progress on programme objectives**.** Public health bodies need to employ appropriate methods to evaluate success in the long term such as econometric modelling, observation studies, epidemiology and reported behaviour. The mix of evaluation tools depends on the type of behaviour, relative costs and the availability of data. Additionally, short to medium term milestones should have been identified and the means for capturing and reporting on the data established.

6. **Have you required that the evaluation will monitor actual behaviour change and the resulting health outcomes?** Progress against short and medium term milestones such as levels of claimed behaviour, attitudes, and awareness should also be measured. These milestones should be based on an understanding of what drives the behaviour of the target audience. Is there commitment and plans to make evaluation results publicly available and ensure they are fed back into planning and development?

7. **Is the budget adequate and proportionate?** Many behaviour change programmes will require budgets allocated on a longer-term basis – at least 3 years to allow for research, piloting and delivery. In the case of pandemic events there may be a need to substantially increase budgets.

    a. Are there contingency plans in place and has scenario planning been completed that allows for different levels of budget to be allocated?

    b. Is there a proposed use of economic analysis to measure the impact of the programme in terms of VFM (Value For Money) ROI (Return On Investment) SORI (Social Return On Investment) and CBA (Cost Benefit Analysis)?

Normally substantial budgets should only be allocated if prior research and piloting work indicates that the full implementation budgets will deliver acceptable levels of impact.

8. **Have you put in place or authorised the mechanisms to ensure that there is integration and alignment between all aspects of the proposed behaviour change programme and existing and or related interventions at Local, National Regional, European and International levels**? Other intervention types can include legislation, fiscal measures, service and vaccine delivery methods, and other related communication programmes such as those related to transport and work.

Proto Tool 14

Ensuring Effective Engagement in Pandemic Communication and Behavioural Influencing Programmes 7 Point Checklist

Important characteristics for designing effective behavioural interventions that have fully engaged stakeholders, partners and communities of interest.

1. Ensure interventions are citizen focused and driven by theory, evidence and research. Understanding of the everyday lives and aspirations of the audience is essential. Use theory to ground and inform development learning from previous work. Draw from a wide range of different types of evidence. Look beyond the visible iceberg of published evidence to evidence locked in the experience and expertise of stakeholders, potential partner organizations, practitioners and communities themselves. Use a range of research methods to get a rounded understanding of what people do and why they do it.

2. Ensure explicit behavioural goals are agreed by all key stakeholders and Partners including community groups. *E*xpress the overall aims of the work in terms of specific behaviour SMART objectives. Avoid reliance on broad and general behavioural goals and instead tailor these to specific sub-groups and segments of the population. Ensure that all stakeholders and partners have had a chance to input into and shape the goals and objectives of the programme and that any disagreement or contentious issues have been fully explored and if possible resolved.

3*. Work to actively engage individuals and communities.* Recognize that engagement is far more important than broadcast communication. Active involvement strengthens development, delivery and evaluation of any intervention. Ensure that a full stakeholder and partner analysis has been completed and that an ongoing management plan is developed. Ensure that a community engagement strategy is developed and sufficient resources are allocated to enable it to be fully implemented.

4. Invest in multi-sector partnership and mobilizing 'delivery coalitions'. Partnership working significantly extends the reach, impact capacity and capability of interventions. Partnerships bring different perspectives, intelligence, evidence and expertise that can significantly enhance customer understanding and insight generation. Ensure that resources have been allocated to deliver effective communication and co-ordination between all coalition members. Ensure that communication systems allow and facilitate the exchange of information such as data, research findings, tracking impact data and situational opportunities and threats.

5. Commit to a sustained approach that mobilizes resources and assets. Ensure all smaller-scale, time-specific interventions are developed and framed in the context of a broader, longer-term strategy or approach. Do not focus exclusively on financial resources. Map and build human skills and capacity and work to mobilize community action. Do not just

focus on ‘deficits’ and problems. Instead, frame interventions around mobilizing coalition and community assets and building latent strengths and capacities within individuals and communities.

6. Use an integrated model to connect national, regional and local efforts. Connecting interventions at different levels can significantly enhance potential impact and effectiveness. Focus on building links, connections and synergies between work at different levels. Recognize that this will take time, effort and the investment of sustained resources. Organizing and planning interventions can be complex, and investing in co-ordination is critical. Summarizing, disseminating information and updates and co-ordinating work are key to ensuring effective stakeholder engagement and coalition delivery.

7. Build a ‘learning and reflective’ culture. The greatest resources available are the people, communities and practitioners involved in pandemic preparation and delivery systems. Capturing, valuing and sharing evidence of effectiveness and experience is important for programme evaluation, strengthening and sustaining work and for motivating people. Evidence and learning should be captured in a systematic way and disseminated actively.

Annexe

Meta Reviews on Behavioural Change in Relation to Health Improvement, Relevant Reference Material and Sources

Introduction

This section of the paper provides an overview of the process and outcomes of a rapid trawl of relevant academic databases, key organisational sites such as WHO, NICE, etc. and the world wide web to identify meta reviews on behavioural change in relation to health improvement.

The criteria used to limit the search were:

- Completion during the last seven years.
- The identification of meta reviews including systematic reviews, summary reviews and books focused on distilling new thinking on behaviour change.
- A focus on health improvement, particularly pandemic events, rather than a clinical or technical intervention focus.

Limitations of Report

This report provides an insight into the extensive literature within this area, rather than being a systematic review of the literature or an exhaustive list of all the literature available in this area. It in no way endorses the findings of any of the literature or reviews, but rather provides a list of the identified literature and reviews in this area identified by the search strategy and meeting the inclusion criteria.

As the NICE Public Health Guidance states, it should be noted that whilst:

'Reviews of reviews are a useful way of bringing together a large body of evidence, and consider broad questions, several limitations need to be acknowledged. Firstly, reviews do not always compare the same thing – some reviews examine outcome data studies, others look at more prospective studies (some consider both) – so interpretation of what is found is complicated by the state of the data pool.

Secondly, some of the high quality reviews might contain poor quality evidence, because that is all that is available. Thirdly, some of the reviews might overlap, and include the same studies. Fourthly, even though no reviews have been done in a particular area (e.g. mass media interventions for preventing illicit drug use), this does not mean that there is not a large body of good primary evidence on that topic. Finally, when looking at the evidence in reviews, we may be limited by the questions that the review authors have decided are important. These may not be the same questions that we have prioritised.'

Methodology

An indicative topic analysis was performed to define the search terms, and identify potentially relevant disciplines for the topic. This enabled the identification of relevant databases to focus the search strategy. Citation analysis techniques were utilised to identify key seminal works, enabling the collation of an index of key terms which were utilised in behavioural change literature to focus the trawl of the available literature. [See Table1]

Table 1: Inclusion Criteria

Category	Criteria
Scope	Systematic reviews.
	Evidence based reviews.
	Meta-analyses.
Conceptual boundaries	Behaviour change.
	Social marketing.
	Health improvement.
Interventions	Throughout the literature, the concept of attempts to promote or support behaviour change is reflected in a large number of ways. Terms utilised to identify such interventions in this review include: initiative, scheme, action, activity, campaign, policy, strategy, procedure, programme, intervention and project.
Disciplines	Behavioural economics.
	Behavioural psychology.
	Social psychology.
	Social marketing.
	Health improvement.
	Health promotion.
	Health communication.
	Public health.
Focal points	Pandemic.
	Outbreak control.
	Outbreak management.
	H1N1.
Language	English.
Year of publication	Between 2005 and 2012.
Exclusions	Learning disabilities. Papers with an explicit clinical or treatment focus or which suggested technical interventions, e.g. tar reduction in cigarettes.

Searches were conducted initially on the Cochrane Database of Systematic Reviews (CDSR), and the Database of Abstracts of Reviews of Effects (DARE) for English language systematic reviews date limited to between 2005-2012. This enabled the primary identification of systematic reviews from a respected source.

Alongside this search, a number of other academic databases and websites were trawled to ensure broad data capture. A full list of the academic databases and websites searched is appended at Annexe A. These searches were restricted by additional terms including 'review', 'meta-analysis', 'evidence-based review' or 'systematic review'. In addition, an email was also sent out via a public health academic e-group to identify any relevant 'grey literature', but with very limited success.

Whilst the initial review identified a significant number of studies within the general topic areas, subsequent analysis of the abstracts for these studies showed that the majority of the

reviews focused on technical interventions, such as reducing the tar content in cigarettes, or provision of placebos, rather than behaviour modification. Such studies were excluded from this report.

Studies on H1N1 and pandemic and outbreak management and control were largely about the effectiveness of interventions, e.g. treatments, rather than focused on behaviours associated with uptake of these treatments. One study[348], which focused on physical interventions to address respiratory viruses, has been included within this document because it provides an insight into a range of interventions which could be considered. Many of the interventions proposed could be considered as potential interventions within a behaviourally focused programme of activity.

The identified reviews were compared with the primary inclusion criteria summarised in Table 1 to determine the relevance of the identified reviews. A full list of the references identified as meeting the primary inclusion criteria is attached at Annexe B.

As a secondary stage of analysis, once papers had passed the primary inclusion criteria, the articles and full text chapters, where available, were accessed. The reference lists of included reviews were searched to identify other reviews included within their analysis which had not been otherwise identified.

This informed the development of the summary list of selected reviews appended at Annexe C. For the purposes of this paper, reviews included within the selected reviews were those which:

- Directly related to pandemic events.
- Directly related to H1N1.
- Were extensively referenced in other publications.
- Provided generic guidance based on systematic reviews of literature across a range of lifestyle challenges.

Annexe A: Search History of Databases

Databases:	Search strategy/results
Cochrane database of systematic reviews http://onlinelibrary.wiley.com/o/cochrane Database of Abstracts of Reviews of Effectiveness (DARE); TRIP; PubMed/Medline NHS EED EconLit Health Systems Evidence OVID	#1 (Behaviour and change):ti,ab,kw, #2 (Social and marketing):ti,ab,kw, #3 (Pandemic):ti,ab,kw, #4 (Outbreak and management):ti,ab,kw, #5 (Outbreak and control):ti,ab,kw, #6 (H1N1):ti,ab,kw, #7 (#1 AND #3) #8 (#2 AND #3) #9 (#1 AND pandemic), #10 (#1 AND H1N1) #11 (#2 AND H1N1) #12 (#2 AND Pandemic) #13 (#1 AND Outbreak AND control) #14 (#2 AND Outbreak AND control) #15 (#1 AND Outbreak AND management) #16 (#2 AND Outbreak AND management) #17 (Behavioural psychology), #18 (Social psychology), #19 (Behavioural psychology), #20 (Health promotion), #21 (#17 AND h1n1) #22 (#18 AND H1n1) #23 (#19 AND H1n1) #24 (#17 AND pandemic) #25 (#18 AND pandemic) #26 (#19 AND pandemic)
Organisational websites	
Department of Health WHO Kings Fund NICE CDC ECDC NSMC	#1 (Behaviour and change) #2 (Social and marketing) #3 (Pandemic) #4 (Outbreak and management) #5 (Outbreak and control) #6 (H1N1) #7 (#1 AND #3) #8 (#2 AND #3) #9 (#1 AND pandemic), #10 (#1 AND H1N1) #11 (#2 AND H1N1) #12 (#2 AND pandemic) #13 (#1 AND outbreak AND control) #14 (#2 AND outbreak AND control) #15 (#1 AND outbreak AND management) #16 (#2 AND outbreak AND management) #17 (Behavioural psychology), #18 (Social psychology), #19 (Behavioural psychology), #20 (Health promotion), #21 (#17 AND h1n1) #22 (#18 AND H1n1)

	#23 (#19 AND H1n1) #24 (#17 AND pandemic) #25 (#18 AND pandemic) #26 (#19 AND pandemic)
WWW to identify books	Behaviour change Social marketing Social psychology Behavioural economics Behavioural psychology Pandemic behaviours H1N1 Health promotion Health improvement

Annexe B: References Matching Preliminary Inclusion Criteria

Generic reviews:

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4.Francis, J.J., et al., *Evidence-based selection of theories for designing behaviour change interventions: using methods based on theoretical construct domains to understand clinicians' blood transfusion behaviour.* Br J Health Psychol, 2009. **14**(Pt 4): p. 625-46.

5.Giles-Corti, B. and A.C. King, *Creating active environments across the life course: "thinking outside the square".* Br J Sports Med, 2009. **43**(2): p. 109-13.

6.Hobbis, I.C. and S. Sutton, *Are techniques used in cognitive behaviour therapy applicable to behaviour change interventions based on the theory of planned behaviour?* J Health Psychol, 2005. **10**(1): p. 7-18; discussion 37-43.

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8.Michie, S., *Is cognitive behaviour therapy effective for changing health behaviours? Commentary on Hobbis and Sutton.* J Health Psychol, 2005. **10**(1): p. 33-6; discussion 37-43.

9.Michie, S., *Designing and implementing behaviour change interventions to improve population health.* J Health Serv Res Policy, 2008. **13 Suppl 3**: p. 64-9.

10.Munro, S., et al., *A review of health behaviour theories: how useful are these for developing interventions to promote long-term medication adherence for TB and HIV/AIDS?* BMC Public Health, 2007. **7**: p. 104.

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18.Kavanagh, A.M., et al., *Sources, perceived usefulness and understanding of information disseminated to families who entered home quarantine during the H1N1 pandemic in Victoria, Australia: a cross-sectional study.* BMC Infect Dis, 2011. **11**: p. 2.

19.Alleyne, G., S. Basu, and D. Stuckler, *Who's afraid of noncommunicable diseases? Raising awareness of the effects of noncommunicable diseases on global health.* J Health Commun, 2011. **16 Suppl 2**: p. 82-93.

20.Barrett, R. and P.J. Brown, *Stigma in the time of influenza: social and institutional responses to pandemic emergencies.* J Infect Dis, 2008. **197 Suppl 1**: p. S34-S7.

21.Bish, A., et al., *Factors associated with uptake of vaccination against pandemic influenza: a systematic review.* Vaccine, 2011. **29**(38): p. 6472-84.

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26. Mortimer Feinberg *Why Smart People Do Dumb Things*,
27. Spencer Johnson and Kenneth Blanchard *Who Moved My Cheese?*
28. Dan Ariely *Predictably Irrational*
29. Ori Brafman *Sway*
30. Alfie Kohn *Punished by Rewards* by
31. Rory Freedman and Kim Barnouin *Skinny Bitch,*
32. Daniel Gilbert *Stumbling on Happiness*,
33. Daniel Goleman *Social Intelligence*,
34. Kat James & Oz Garcia *The Truth About Beauty*
35. *Small Change: It's the Little Things in Life That Make a Big Difference!* It is not specific to a single type of life change, but offers a way to start making significant life changes by starting small, and shows how quickly these obvious small changes can really add up and make a big difference.
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Annex G:

Additional Social Marketing Effectiveness papers reviewed

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Annex H:

Other relevant references reviewed

Winpenny Eleanor, et al. 2020 Health.org From One to Many: the Risks of Frequent Excessive Drinking

London: 2020health.org 2011 Web publication

This project looked at those termed ‘risky drinkers’ who are increasing the risk to their future health by their high alcohol consumption. It focused on **Individual screening** for alcohol consumption to identify ‘risky drinkers’ and the provision of **Brief Interventions** to tackle this drinking behaviour. It discussed the challenges to delivery of this kind of early treatment in GP practices and make recommendations for implementation of more universal screening and provision of **Brief Interventions**. It then goes on to discuss the drivers for and against ‘risky drinking’, and the influence that **Government policy** can have on people’s decisions, making comparisons with regulation and policy in other European countries.

http://www.2020health.org/dms/2020health/downloads/reports/FINAL-2020alcohol06-10-111/FINAL%202020alcohol06-10-111.pdf

BUPA Health Pulse 2011: International Healthcare Survey: Global Trends, Attitudes and Influences.

London : BUPA, 2011 Web publication

BUPA Health Pulse is BUPA’S Annual International Healthcare Survey. In 2011, 13,000 people were surveyed in twelve markets: the UK, Spain, Australia, Mexico, India, the USA, Brazil, China, New Zealand, Saudi Arabia, Hong Kong and Thailand. The report analyzes

and explores the key international findings of the survey. It aims to **provide an insight into peoples' health behaviour and their perceptions of health and healthcare** around the world.

http://www.bupa.com/media/284419/bupa_health_pulse_2011_interactive.pdf

Great Britain. Cabinet Office. Behavioural Insights Team. Behavioural Insights Team: Annual Update 2010-11.

London : Cabinet Office, 2011 Web publication

This report outlines a series of new approaches that the **Behavioural Insight** team has tested over the past year to increase people's health, encourage them to make their houses more energy efficient or boost tax repayment rates.

http://www.cabinetoffice.gov.uk/sites/default/files/resources/Behaviour-Change-Insight-Team-Annual-Update_acc.pdf

Mitchell, Sheila Great Britain. Department of Health. Change4Life: Three Year Social Marketing Strategy. London : DH, 2011 Web publication

This document sets out a new three-year marketing strategy (2011–14) for the Change4Life programme. It is published as a companion to Healthy Lives, Healthy People: A call to action on obesity in England and describes how the Change4Life social marketing programme will support the achievement of the new national obesity ambitions, as well as promoting other, broader, lifestyle changes.

http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_130488.pdf

Associated documentation:

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_130475

Great Britain. Department of Health Changing Behaviours, Improving Outcomes: Social Marketing Strategy for Public Health. London: DH, 2011 Web publication

This document sets out the Department of Health's three year social marketing strategy for changing health-related lifestyle behaviours and improving health outcomes.

http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_126449.pdf

Associated documentation:

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_126409

Brunello, Giorgio, et al. The Institute for the Study of Labor (IZA) The Causal Effect of Education on Health: What is the Role of Health Behaviours? IZA Discussion Paper 5944 (August 2011) Bonn: IZA, 2011 Web publication

In this paper the contribution of health related behaviours to the education gradient is investigated, using an empirical approach that addresses the endogeneity of both education and behaviours in the health production function. It applies this approach to a multi-country data set, which includes twelve European countries and has information on education, health and health behaviours from a sample of individuals aged 50+.

http://ftp.iza.org/dp5944.pdf

Cawley, John and Ruhm, Christopher J. The Institute for the Study of Labor (IZA) The Economics of Risky Health Behaviours. IZA Discussion Paper 5728 (May 2011) Bonn: IZA, 2011 Web publication

Risky health behaviours such as smoking, drinking alcohol, drug use, unprotected sex, and poor diets and sedentary lifestyles (leading to obesity) are a major source of preventable deaths. This chapter **overviews the theoretical frameworks for, and empirical evidence on, the economics of risky health behaviours**.

http://ftp.iza.org/dp5728.pdf

Ipsos MORI Long Term Health Conditions 2011: Research study conducted for the Department of Health. London: Ipsos MORI, 2011 Web publication

This study by Ipsos MORI for the Department of Health explores attitudes towards 'self-care' and the public's perceptions and behaviour with regard to both their own health and the NHS generally. It aims to capture the attitudes and behaviour of those people with a long term condition regarding the self management of their condition and their use of healthcare services.

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_130785

Neuberger, Julia, Baroness Neuberger Chair Great Britain. Parliament. House of Lords. Select Committee on Science and Technology. Sub-Committee I Behaviour change: 2nd report of session 2010-12. House of Lords papers. Session 2010-12 ; HL 179 London : Stationery Office, 2011 Hl (Gre)

This report - the culmination of a year-long investigation into the way the government tries to influence people's behaviour using behaviour change interventions – finds that "nudges" used in isolation will often not be effective in changing the behaviour of the population. Instead, it recommends that a whole range of measures – including some regulatory measures – will be needed to change behaviour in a way that will make a real difference to society's biggest problems.

http://www.publications.parliament.uk/pa/ld201012/ldselect/ldsctech/179/179.pdf

Government response:

http://www.parliament.uk/documents/lords-committees/science-technology/behaviourchange/BCGovernmentResponse.pdf

Reeves, Richard. Great Britain. Department of Health. A Liberal Dose? Health and Wellbeing: The Role of the State: An Independent Report. London : DH, 2010 HI (Ree)

A difficult question for any government is how far to intervene in the choices and behaviour of individuals in order to promote their own, or 'others' health. This report sets out evidence about what the public think about this question; explores the key issues at stake; clarifies principles for state intervention; suggests a new framework to guide decision making; and proposes a new narrative for future state intervention.

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_111697

Dolan, Paul, et al. The Institute for Government Mindspace : influencing behaviour through public policy London : Institute for Government, 2010 Web publication

MINDSPACE explores how behaviour change theory can help meet current policy challenges, such as how to reduce crime, tackle obesity and ensure environmental sustainability.

http://www.instituteforgovernment.org.uk/sites/default/files/publications/MINDSPACE.pdf

Fichera, Eleonora and Sutton, Matt University of York. Health Economics Resource Centre. Health, Econometrics and Data Group State and Self Investments in Health.

HEDG Working Paper 10/23 York: HERC, 2010 Web publication

http://www.york.ac.uk/res/herc/documents/wp/10_23.pdf

All-Party Parliamentary Group, Primary Care and Public Health Inquiry report into Public Health Information. [London: APPG on Primary Care & Public Health], 2009 Web publication

http://www.pagb.co.uk/appg/inquiries/Public%20Helath%20Information%20final%20report.pdf

Le Grand, Julian, et al. Health England Incentives for Prevention. London: Health England, 2009 Web publication Health England report no. 3

This paper reviews some of what is known about **economic incentive schemes** and also considers the potential role of agencies involved in policy that directly or indirectly affect health in these areas. It applies five criteria to help identify the relative strengths and

weaknesses of different schemes: their effectiveness, their cost relative to effectiveness, their impact on equity, their feasibility and their impact on individual and local autonomy.

http://www.healthengland.org/publications/HealthEnglandReportNo3.pdf

Great Britain. Parliament. Parliamentary Office of Science & Technology

Delaying Gratification.

POST Note 328 March 2009

London: POST 2009 Web Publication

Evidence shows that people may be biased towards seeking short-term rewards at the expense of greater long-term benefits. Several factors influence how biased people are likely to be towards the present. Understanding these could inform policies that encourage individuals to make important life choices that affect their own long-term interests. This note **reviews evidence on the influence of time in decision-making**, and looks at the implications for policy domains such as pensions, health and consumer affairs.

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Kicking Bad Habits 4

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Annexe I: Summary of Selected Review Findings: Abstracts Taken From Public Data Sources and Summarised Where Applicable

Author and Date	Review Type	Study Population	Review Objective	Key Results
GENERIC REVIEWS				
NICE Guidance PH006 October 2007	Guidance on interventions	UK focused	Guidance on behaviour change, providing principles for action based on six meta reviews of evidence	The recommendations include the following advice: Base interventions on a proper assessment of the target group, where they are located and the behaviour which is to be changed, careful planning is the cornerstone of success. Work with other organisations and the community itself to decide on and develop initiatives; build on the skills and knowledge that already exists in the community, for example, by encouraging networks of people who can support each other, take account of – and resolve – problems that prevent people changing their behaviour (for example, the costs involved in taking part in exercise programmes or buying fresh fruit and vegetables, or lack of knowledge about how to make changes) base all interventions on evidence of what works. Train staff to help people change their behaviour. Evaluate all interventions.
NICE 2007 Behaviour change: cost effectiveness analysis	Cost effectiveness analysis	A systematic search of six databases was undertaken in June 2006 using a specified set of search terms as well as inclusion and exclusion criteria.	To summarise the available evidence on the cost effectiveness of interventions and programmes designed to change knowledge, attitude and behaviour in the whole population and specific communities (including families and individuals) in order to help to promote healthier lifestyles and reduce the risk of developing CHD.	A set of evidence statements is provided, by paper, for • Exercise (page 37) • Smoking (page 39) • Combined interventions (pages 41 to 42) • Diet (pages 45 to 57)
NICE 2007 Behaviour change: Review 1 - Effectiveness review	Effectiveness review	The summary of a 'review of reviews', which aims to bring together a large body of evidence and provide a critical and structured overview of the effectiveness of interventions and models to change attitudes, knowledge and behaviours in six different areas.	The six health behaviours considered here are: • Cigarette smoking • Alcohol drinking (excluding alcohol dependency) • Physical activity • Healthy eating (excluding diet for weight loss) • Illicit drug use (excluding drug dependency) • Sexual risk taking in young people The main objectives	Evidence statements were drawn up based on the level of evidence, the efficacy of the intervention and the applicability of the research question to the UK.

Author and Date	Review Type	Study Population	Review Objective	Key Results
			were to evaluate: • Which are the most effective interventions to change knowledge, attitudes and health behaviours in each of these six areas? • Is there any evidence to suggest that some interventions are effective / ineffective across the range of health behaviours? • Which are the most effective models and approaches used in these interventions? • What is the evidence for the effectiveness of interventions in targeting health inequalities within particular population sub-groups? • What are the gaps in the evidence base?	
NICE 2007 Behaviour change: Review 2 - Road safety	Road Safety	Three topic areas were selected on the basis of their relevance to the guidance and their potential for yielding useful evidence: • Road safety • Pro-environmental behaviour change • Marketing to low income consumers	The aim was to gather evidence on behaviour change from other fields, such as marketing, psychology, the environment or criminal justice, which might transfer to or yield useful learning for public health interventions.	Demonstrates effectiveness of prompting incentives, goal setting and designing strategies for specific behaviours within populations.
NICE 2007 Behaviour change: Review 3 - Resilience, coping and salutogenic approaches to maintaining and generating health	Resilience, coping and salutogenic approaches to maintaining and generating health	The review is divided into two sections. The first section: 'characteristics of approaches to maintaining and generating health' aims to consider the theoretical frameworks used by research in this area, the approaches of researchers to these three areas and how these theories and areas of research have been applied to practice based interventions. The second section: 'evidence on approaches to maintaining and generating health' considers the empirical evidence	The two sections address the following questions: Section One 1. What are the key theories and models of resilience, coping and salutogenesis used in contemporary research? 2. How have researchers approached these research areas? 3. How have these theories been applied in practice? What kind of initiatives are there and what are their core characteristics and rationales? 4. What evidence has been produced on the positive	Identification of conceptual issues and implications in terms of the application of the proposed strategies.

Author and Date	Review Type	Study Population	Review Objective	Key Results
		on the factors and processes thought to facilitate positive adaptation and the effectiveness of interventions and programmes engaged in generating these 'protective' resources and contexts.	adaptation of people despite conditions of social-structural adversity? 5. What evidence is there on the effectiveness of interventions engaged in generating contexts and resources which might facilitate coping, resilience and positive development among disadvantaged groups?	
NICE 2007 Behaviour change: Review 4 - Models	Literature review		Review of behaviour change models.	None of the models examined in this review is specified adequately to incorporate and interpret the significance of social, economic and/or environmental factors as predictors and determinants of health behaviour. Many of the components and psychological constructs they contain relate to cognitions and perceptions that are a function of 'subjects' responses to their environments. Suggests models not generally used effectively.
NICE 2007 Behaviour change: Review 5 - Socio-cultural context	Literature review		This review sought to identify and evaluate evidence relating to how the social and cultural context in which people live influences the effectiveness of interventions to change health knowledge, attitudes, intensions and behaviours.	Variations in health behaviours and outcomes are strongly linked to socio-economic and allied variables. The search conducted for this review found no studies that had investigated in any significant depth the mechanisms underpinning relationships between income and social positioning and the success or otherwise of health behaviour interventions. There also appears to be a lack of focused research evidence on the extent to which, and why, members of ethnic minority groups may benefit from culturally specific health behaviour change interventions, over and above the benefits that they can gain from less specifically targeted interventions.
NICE 2007 Behaviour change: Review 6 - Social marketing	Literature and narrative review	It draws upon several types of evidence: - a narrative review on the nature of marketing and social marketing as behaviour change techniques (Section 3) - a review of marketing strategies for low-income consumers (Section 4) - a recent systematic review of the extent and nature of food promotion to children and its effects on their food knowledge, preferences and behaviour (Section 5) - a series of reviews of social marketing effectiveness in changing health		The report identifies several key, fairly generic learning points for public health: - Move away from a prescriptive approach and 'get to know' the target group(s). Seek to understand the problem from their perspective – identify their motivations and the factors that influence their behaviour. These insights are particularly important when trying to influence 'hard-to-reach' groups like low-income households. Formative research can be a useful navigational aid and can help provide some of this understanding. - Group individuals according to the similarity of their needs then identify the most appropriate group(s) around whom to organise the marketing effort. Develop a marketing strategy that utilises the various elements of the marketing mix (e.g. promotion, distribution, product) and is tailored to the specific requirements of the target group(s). - Identify any competition to behaviour change that exists (e.g. apathy, effort, time) and consider how to best remove or minimise its influence. It is critical to make it easy for people to adopt new behaviours, especially in the case of vulnerable groups (e.g. children, low-income) who face extra difficulties. An insider perspective of these difficulties can be especially insightful and can highlight problems that may be otherwise difficult to detect.

Author and Date	Review Type	Study Population	Review Objective	Key Results
		behaviours (Section 6).		-In the past marketers viewed the low-income market as 'problematic', alienated and difficult to reach. However, they soon realised that this was because they were not communicating with low-income consumers in the right way and were offering them products and services not suited to their needs. Following a change in mindset – and by listening to their needs, marketers discovered that they could engage with low income consumers and successfully influence their behaviour. The public health community should adopt a similar mindset when trying to influence this group. - In public health, positive emotion and branding are potentially useful but typically underused (in huge contrast to commercial marketing). Consideration should be given to the use of positively framed and upbeat messages (e.g. Stressing the benefits to be gained from a healthy lifestyle rather than the consequences of an unhealthy one). Convenience is especially important among the low- income market. The commercial sector has learned to bring messages and services to this group by infiltrating local communities, engaging in grassroots marketing and providing a range of services under one roof. A grassroots approach is helpful for tackling issues of mistrust. The public health community could make use of some of these strategies to help to penetrate the low-income sector. It is important to do things over and over again. For example, food marketers advertise to children continuously because they know that repeated exposure to advertising increases its effectiveness. Stakeholders and other key influencers should be identified and accounted for in the marketing strategy. The target group's environment should be addressed and 'upstream' change targeted where appropriate. Like the commercial sector, the public health community should also engage in long term thinking and view engagement with the target group(s) as strategic on-going relationships, not discrete interactions.
H1N1 focused reviews				
Bhattacharyya S, Bauch CT. Vaccine. 2011 Jul 26;29(33):5519-25. Epub 2011 May 20. "Wait and see" vaccinating behaviour during a pandemic: a game theoretic analysis.	Evidence review	US	During the 2009 H1N1 pandemic, many individuals did not seek vaccination immediately but rather decided to "wait and see" until further information was available on vaccination costs. This behaviour implies two sources of strategic interaction: as more individuals become vaccinated, both the perceived vaccination cost and the probability that susceptible individuals become infected decline. This review analyses the outcome of these two strategic	Suggests that any effect of risk communication at the start of a pandemic outbreak will be amplified compared to the same amount of risk communication effort distributed throughout the outbreak.

Author and Date	Review Type	Study Population	Review Objective	Key Results
			interactions by combining game theory with a disease transmission model during an outbreak of a novel influenza strain.	
Maurer J, Harris KM. Prev Med. 2011 Jun;52(6):459-64. Epub 2011 Mar 30. Contact and communication with healthcare providers regarding influenza vaccination during the 2009-2010 H1N1 pandemic.	Evidence review	Analyzed data from 4040 U.S. adult members of a nationally representative online panel surveyed between March 4th and March 24th, 2010	The existence of two vaccines-seasonal and pandemic-created the potential for confusion and misinformation among consumers during the 2009-2010 vaccination season. The purpose of the review was to measure the frequency and nature of influenza vaccination communication between healthcare providers and adults for both seasonal and 2009 influenza A (H1N1) vaccination and quantified its association with uptake of the two vaccines.	**RESULTS:** 64.1% (95%-CI: 61.5%-66.6%) of adults did not receive any provider-issued influenza vaccination recommendation. Adults who received a provider-issued vaccination recommendation were 14.1 (95%-CI: -2.4 to 30.6) to 32.1 (95%-CI: 24.3-39.8) percentage points more likely to be vaccinated for influenza than adults without a provider recommendation, after adjusting for other characteristics associated with vaccination. **CONCLUSIONS:** Influenza vaccination communication between healthcare providers and adults was relatively uncommon during the 2009-2010 pandemic. Increased communication could significantly enhance influenza vaccination rates.
Bish A, Yardley L, Nicoll A, Michie S. Vaccine. 2011 Sep 2;29(38):6472-84. Epub 2011 Jul 12. Factors associated with uptake of vaccination against pandemic influenza: a systematic review.	A systematic literature review searching Web of Science and PubMed databases up to 24 January 2011.		To examine the psychological and demographic factors associated with uptake of vaccination during the 2009 pandemic.	The review found that both the degree of threat experienced in the 2009 pandemic influenza outbreak and perceptions of vaccination as an effective coping strategy were associated with stronger intentions and higher uptake of vaccination. Appraisal of threat resulted from both believing oneself to be at risk from developing H1N1 influenza and concern and worry about the disease. Appraisal of coping resulted from concerns about the safety of the vaccine and its side effects. There was evidence of an influence of social pressure in that people who thought that others wanted them to be vaccinated were more likely to do so and people getting their information about vaccination from official health sources being more likely to be vaccinated than those relying on unofficial sources. There was also a strong influence of past behaviour, with those having been vaccinated in the past against seasonal influenza being more likely to be vaccinated against pandemic influenza. Demographic factors associated with higher intentions and uptake of vaccination were: older age, male gender, being from an ethnic minority and, for health professionals, being a doctor. Interventions designed to increase vaccination rates could be developed and implemented in advance of a pandemic. Strategies to improve uptake of vaccination include interventions which highlight the risk posed by pandemic influenza while simultaneously offering tactics to ameliorate this risk (e.g. vaccination). Perceived concerns about vaccination can be tackled by reducing the omission bias (a perception that harm caused by action is worse than harm caused by inaction). In addition, interventions to increase seasonal influenza vaccination in advance of a future pandemic may be an effective strategy.

Author and Date	Review Type	Study Population	Review Objective	Key Results
Poland GA. Vaccine. 2010 Sep 7;28 Suppl 4:D3-13. The 2009-2010 influenza pandemic: effects on pandemic and seasonal vaccine uptake and lessons learned for seasonal vaccination campaigns.	Evidence review	Individual and national/cultural differences were apparent in response to the 2009-2010 influenza pandemic. Overall pandemic influenza immunization rates were low across all nations, including among healthcare workers.	To review cross-cultural responses to pandemic influenza, and seek to apply those lessons to seasonal influenza immunization programmes.	Among the reasons for the low coverage rates it may have been a lack of concern about the individual risk of influenza, which may translate into a lack of willingness or urgency to be vaccinated, particularly if there is mistrust of information by public health or governmental authorities. Intuitively, a link between willingness to be vaccinated against seasonal influenza and against pandemic influenza exists, given the similarities in decision-making for this infection. As such, the public is likely to share common concerns regarding pandemic and seasonal influenza vaccination, particularly in the areas of vaccine safety, side effects and personal risk. Given the public's perception of the low level of virulence of the recent pandemic influenza virus, there is concern that the perception of a lack of personal risk of infection and risk of vaccine side effects could adversely affect seasonal vaccine uptake. While governments are more often concerned about public anxiety and panic, as well as absenteeism of healthcare and other essential workers during a pandemic, convincing the public of the threat posed by pandemic or seasonal influenza is often the and underappreciated task. Appropriate, timely, and data-driven health information are very important issues in increasing influenza vaccine coverage, perhaps even more so in western societies where trust in government and public health reports may be lower than in other countries.
Hofmann F, Ferracin C, Marsh G, Dumas R. Infection. 2006 Jun;34(3):142-7. Influenza vaccination of healthcare workers: a literature review of attitudes and beliefs.	Literature review	Influenza vaccination coverage among healthcare workers (HCW) is insufficient despite health authority recommendations in many countries. Numerous vaccination campaigns encouraging HCW to be vaccinated have met with resistance.	To review the published influenza vaccination programmes in healthcare settings, to understand the reasons for their success and failure, as well as the attitudes and beliefs of HCW.	**RESULTS:** Thirty-two studies performed between 1985 and 2002 reported vaccination rates of 2.1-82%. Vaccination campaigns including easy access to free vaccine and an educational programme tended to obtain the highest up take, particularly in the USA. Yet, even this type of campaign was not always successful. Two main barriers to satisfactory vaccine uptake were consistently reported: (1) misperception of influenza, its risks, the role of HCW in its transmission to patients, and the importance and risks of vaccination (2) lack of (or perceived lack of) conveniently available vaccine. To overcome these barriers and increase uptake, vaccination campaigns must be carefully designed and implemented taking account of the specific needs at each healthcare institution.
Rubin G, Potts H, Michie S. The impact of communications about swine flu (influenza A H1N1v) on public responses to the outbreak: results from 36 national telephone surveys in the UK Health Technology Assessment 2010; 14(34): 183-266 http://www.hta.ac.uk/fullmono/mon1434.pdf#nameddest=article03	Health technology assessment	Analysis of the data from 36 of these surveys, covering the period between 1 May 2009 and 10 January 2010. Data for the last four surveys were still being finalised when this analysis was conducted	1.To assess whether changes in the volume of media reporting about swine flu were associated with changes in the percentage of people who reported being worried about the possibility of catching swine flu or with other changes in the way the outbreak was perceived. 2. To assess how many members of the UK public	Implications for practice 1.Uptake of recommended behaviours during the swine flu outbreak was low. Maximising the impact of communications campaigns that promote protective behaviours during future pandemics is therefore important. The results show that psychological processes are important to consider when designing campaigns. 2.Rapid-turnaround surveys can be useful as part of a public health response to evaluate whether communications campaigns have had an effect on behaviour and to identify what factors mediated this process. However, in order to get the most out of analysing such data, it is important that the most appropriate constructs are measured using wording and response options that maximise reliability and validity of measurement. This is true both of psychological predictors and of self-report measures of behaviour. Seeking early advice from behavioural

Author and Date	Review Type	Study Population	Review Objective	Key Results
			would have accepted the swine flu vaccine had it been offered to them, and to identify whether likely acceptance was predicted by worry about the possibility of catching swine flu, perceptions about the outbreak or the amount or type of information about the outbreak. 3. To assess whether being more likely to have the seasonal flu vaccine as a result of the swine flu outbreak was predicted by worry about the possibility of catching swine flu, perceptions about the outbreak or the amount or type of information about the outbreak. 4. To assess what percentage of the public had performed recommended and non recommended behaviours in the early stages of the outbreak. 5. To assess whether people who had been exposed to media coverage or advertising about swine flu were more likely to perform recommended or non-recommended behaviours, and to assess whether effects of media coverage or advertising were due to changes in knowledge about swine flu, levels of worry about the possibility of catching swine flu or perceptions about the efficacy of	scientists on these issues is recommended in any future outbreak. It is also recommended that a model template for such a survey be designed in advance of a future pandemic. 3.During a future outbreak, raising levels of worry about the possibility of catching a disease from low levels is likely to increase uptake of behavioural recommendations. However, it is also likely to increase uptake of non-recommended behaviours. Conversely, attempts to reassure the public about their chances of becoming ill during a future infectious disease outbreak are likely to reduce rates of behaviour change. How to steer the best course in the face of these conflicting influences requires the application of general principles to the specifics of any particular situation. 4.Emphasising the efficacy of recommended behaviours in any future campaign should help to maximise the campaigns impact on those behaviours. Importantly, although increasing levels of worry might increase rates of all protective behaviours, regardless of whether they had been recommended or not, the results suggest that communicating the efficacy of a specific behaviour may have an impact on that behaviour alone.

Author and Date	Review Type	Study Population	Review Objective	Key Results
			different protective actions.	
Patel M S, Davis M M Could a federal programme to promote influenza vaccination among elders be cost-effective? Preventive Medicine 2006; 42: 240-246	Cost effectiveness analysis	Five primary studies	To study the use of a federal programme to promote influenza vaccination in the elderly, patterned after a direct-to-consumer (DTC) advertising programme.	DTC-style promotional campaigns for influenza vaccination among the elderly may represent a cost-effective strategy for the federal government to pursue. There was no recommendation for further research.
Ndiaye SM, Hopkins DP, Shefer AM, Hinman AR, Briss PA, Rodewald L, Willis B Interventions to improve influenza, pneumococcal polysaccharide, and hepatitis B vaccination coverage among high-risk adults: a systematic review. American Journal of Preventive Medicine 2005; 28(5 Supplement): 248-279	Review – narrative synthesis	Primary studies that evaluated interventions to improve vaccination coverage of influenza, pneumococcal polysaccharide infections and Hepatitis B in individuals (aged 65 years and under) at a high risk for infection, morbidity, or mortality, compared with an unexposed or less-exposed population, were eligible for inclusion. Studies had to be conducted in an established market economy, and measure differences or changes in vaccination coverage. Simple before-and-after comparisons, cross-sectional surveys, and post-only study designs were excluded. Interventions were classified as: increased demand (client education, reminders and incentives) provider or system-based (standing orders and provider education, reminders and feedback); or enhanced access (increased access and reduction in out-of-pocket costs). Most studies evaluated the uptake of the influenza vaccine. Only three studies were conducted outside of North America; two in The Netherlands, and one in Switzerland.	To evaluate the effectiveness of interventions to improve vaccination cover in targeted high-risk populations.	The combination of interventions that showed strong evidence of effectiveness for increasing targeted vaccination coverage was enhanced access to vaccination services plus provider- or system-based interventions and/or interventions to increase client or community demand for vaccinations (median improvement 16.5 percentage points, range -5.9 to 67; 16 studies).

Author and Date	Review Type	Study Population	Review Objective	Key Results
Krebs P, Prochaska JO, Rossi JS. A meta-analysis of computer-tailored interventions for health behaviour change. Preventive Medicine 2010; 51(3-4): 214-221	Systematic review	Controlled studies of computer-tailored interventions aimed at changing health behaviours compared with a non-tailored comparison group were eligible for inclusion. Computer-tailored interventions had to be provided primarily through communication channels that did not use live counsellors. Eligible studies had to report sufficient data to enable calculation of effect sizes. In the included studies, computer-tailored interventions were aimed at smoking cessation, increased physical activity, improved dietary practices and mammography screening. Control groups included assessment only or minimal intervention (such as brochures, behavioural feedback only and no treatment). Most studies evaluated one health behaviour some studies evaluated two or more health behaviours.	To assess the efficacy of computer-tailored interventions for health behaviour change.	The review concluded that computer-tailored interventions had potential to improve health behaviours and suggested strategies that may lead to greater effectiveness of these techniques. The authors' conclusions reflect the evidence presented, but the lack of validity assessment and differences between studies make the reliability of the conclusions uncertain.
Public Health Reports Volume 125, Issue 6, November 2010, Pages 789-792 Easier said than done: Behavioral conflicts in following social-distancing recommendations for influenza prevention (Review) Kozlowski, L.T., Kiviniemi, M.T. Ram, P.K.	Review		An analysis of how social pressures influence behaviours relevant to preventing disease transmission can aid public health officials in considering how to make effective recommendations concerning H1N1 and other infectious disease situations. ©2010 Association of Schools of Public Health.	Preventing transmission of H1N1 and other infectious diseases can require individuals to change behaviours, but recommendations to change behaviour can run counter to other powerful influences. For example, instructions not to shake hands or avoid certain public gatherings can run counter to substantial social pressures to shake hands or be in attendance. These behavioural conflicts are illustrated with an experience of the relative ineffectiveness of voluntary recommendations, which highlights the importance of considering these social pressures when determining what recommendations to make and how to make them.
Bailey JV, Murray E, Rait G, Mercer CH, Morris RW, Peacock R, Cassell J, Nazareth I. Interactive computer-based interventions for sexual health promotion. Cochrane Database of Systematic Reviews 2010, Issue 9. Art. No.: CD006483. DOI:	Systematic review	The review evaluated 15 RCT's involving 3917 participants	To determine effects of interactive computer-based interventions (ICBI) for sexual health promotion, considering cognitive, behavioural, biological and economic outcomes.	ICBI are effective tools for learning about sexual health, and they also show positive effects on self-efficacy, intention and sexual behaviour. More research is needed to establish whether ICBI can impact on biological outcomes, to understand how interventions might work, and whether they are cost-effective.

Author and Date	Review Type	Study Population	Review Objective	Key Results
10.1002/14651858.CD006483.pub2.				
Gardner B, Whittington C, McAteer J, Eccles MP, Michie S. Soc Sci Med. 2010 May;70(10):1618-25. Epub 2010 Feb 16. Using theory to synthesise evidence from behaviour change interventions: the example of audit and feedback.	Evidence synthesis		Outlines/tests a method for applying theory to evidence syntheses of behaviour change interventions.	Outlines a method for applying theory to evidence syntheses of behaviour change interventions. The authors illustrate this method with an analysis of 'audit and feedback' interventions, based on data from a Cochrane review. The analysis is based on 'Control Theory', which suggests that behaviour change is most likely if feedback is accompanied by comparison with a behavioural target and by action plans, and the authors coded interventions for these three techniques. Multivariate meta-regression was performed on 85 comparisons from 61 studies. However, few interventions incorporated targets or action plans, and so meta-regression models were likely to be under fitted due to insufficient power. The utility of the approach could not be tested via the analysis because of the limited nature of the audit and feedback interventions. Conceptualising and categorising interventions using behaviour change theory can reveal the theoretical coherence of interventions and so point towards improvements in intervention design, evaluation and synthesis. The results demonstrate that a theory-based approach to evidence synthesis is feasible, and can prove beneficial in understanding intervention design, even where there is insufficient empirical evidence to reliably synthesise effects of specific intervention components.
Michie S, Jochelson K, Markham WA, Bridle C. J Epidemiol Community Health. 2009 Aug;63(8):610-22. Epub 2009 Apr 21. Low-income groups and behaviour change interventions: a review of intervention content, effectiveness and theoretical frameworks.	Systematic review	Of 9766 papers identified by the search strategy, 13 met the inclusion criteria	Investigated the effectiveness of interventions targeting low-income groups to reduce smoking or increase physical activity and/or healthy eating.	Interventions were heterogeneous, comprising 4-19 techniques. Nine interventions had positive effects, seven resulted in no change and one had an adverse effect. Effective interventions had a tendency to have fewer techniques than ineffective interventions, with no evidence for any technique being generally effective or ineffective. Only six studies cited theory relative to intervention development, with little information about how theory was used and no obvious association with intervention content or effect.
Marynissen HM. Acta Chir Belg. 2011 Jul-Aug;111(4):193-9. The relationship between organisational communication and perception.	Review		Reviews different communication theories, points out key concepts in the literature on individual and collective perceptions, and suggests directions to further research.	This paper argues that to influence the receivers' perception, a specific form of communication that is embedded in a specific organisational culture is required. It also demands prior knowledge of the existing organisational schemata and the current perception concerning the topic that has to be communicated. The rationale is that three obstacles hinder the objectives of traditional communication strategies to influence perception according to the sender's objectives. The first challenge is that a receiver of a certain message never garners one single, clearly pronounced message conveyed by one single person. The second strain is the dual mode of thinking that forms organisational members' perceptions: the heuristic and the cogitative (Taleb, 2010). Most organisational communication theories are based on the paradigm in which receivers of information process this information in a rational way, while research in the field of neurobiology (Lehrer, 2009) indicates that rationality is dominated by emotions. The third difficulty is that organisational members constrain to well-established, ingrained schemas (Labianca et al., 2000; Balogun and Johnson, 2004). Based on these existing schemas, the scattered information from multiple sources, and the inability

Author and Date	Review Type	Study Population	Review Objective	Key Results
				to process that information through cognitive reasoning, organisational members construct perceptions that are not in line with the objectives of the sender's communication.
van Achterberg T, Huisman-de Waal GG, Ketelaar NA, Oostendorp RA, Jacobs JE, Wollersheim HC. How to promote healthy behaviours in patients? An overview of evidence for behaviour change techniques. Health Promote Int. 2011 Jun;26(2):148-62. Epub 2010 Aug 25.	Review of systematic reviews	Included: 23 systematic reviews: 14 on smoking cessation, 6 on physical exercise, and 2 on healthy diets and 1 on both exercise and diets.	To identify the evidence for the effectiveness of behaviour change techniques, when used by health-care professionals, in accomplishing health-promoting behaviours in patients.	None of the behaviour change techniques demonstrated clear effects in a convincing majority of the studies in which they were evaluated. Techniques targeting knowledge (n = 210 studies) and facilitation of behaviour (n = 172) were evaluated most frequently. However, self-monitoring of behaviour (positive effects in 56% of the studies), risk communication (52%) and use of social support (50%) were most often identified as effective. Insufficient insight into appropriateness of technique choice and quality of technique delivery hinder precise conclusions. Relatively, however, self-monitoring of behaviour, risk communication and use of social support are most Effective Health professionals should avoid thinking that providing knowledge, materials and professional support will be sufficient for patients to accomplish change and consider alternative strategies which may be more effective.
Sutton S. The contribution of behavioural science to primary care research: development and evaluation of behaviour change interventions. Prim Health Care Res Dev. 2011 Oct;12(4):284-92.	Review	Review of research programme on prevention of chronic disease and its outcomes.	Aims to show how behavioural science can contribute to primary care research, specifically in relation to the development and evaluation of interventions to change behaviour.	Concludes with a number of recommendations: (i) whether the aim is prediction, explanation or change , defining the target behaviour is a crucial first step; (ii) interventions should be explicitly based on theories that specify the factors that need to be changed in order to produce the desired change in behaviour; (iii) intervention developers need to be aware of the differences between different theories and select a theory only after careful consideration of the alternatives assessed against relevant criteria; and (iv) developers need to be aware that interventions can never be entirely theory based.
Franks H, Hardiker NR, McGrath M, McQuarrie C. Public health interventions and behaviour change: reviewing the grey literature. Public Health. 2012 Jan;126(1):12-7. Epub 2011 Nov 29.	Review of grey literature	Study design: Sourcing, reviewing and analysis of 36 pieces of relevant grey literature.	This study identified and reviewed grey literature relating to factors facilitating and inhibiting effective interventions in three areas: the promotion of mental health and well-being, the improvement of food and nutrition, and interventions seeking to increase engagement in physical activity.	A variety of approaches, often short-term, were used both as interventions and outcome measures. Interventions tended to have common outcomes, enabling the identification of themes. These included improvements in participant well-being as well as identification of barriers to, and promoters of, success. Most interventions demonstrated some positive impact, although some did not. This was particularly the case for more objective measures of change, such as physiological measurements, particularly when used to evaluate short-term interventions. Objective health measurement as part of an intervention may act as a catalyst for future behaviour change. Time is an important factor that could either promote or impede the success of interventions for both participants and facilitators. Likewise, the importance of involving all stakeholders, including participants, when planning health promoting interventions was established as an important indicator of success.
Jepson RG, Harris FM, Platt S, Tannahill C.BMC Public Health. 2010 Sep 8;10:538. The effectiveness of interventions to change six health behaviours: a review of reviews.	Review	Included 103 reviews published between 1995 and 2008. The focus of interventions varied, but those targeting specific individuals were generally designed to change an existing behaviour (e.g. cigarette smoking, alcohol misuse),	To identify interventions that are effective in achieving behavioural change.	Interventions that were most effective across a range of health behaviours included physician advice or individual counselling, and workplace- and school based activities. Mass media campaigns and legislative interventions also showed small to moderate effects in changing health behaviours. Generally, the evidence related to short-term effects rather than sustained/longer-term impact and there was a relative lack of evidence on how best to address inequalities.

Author and Date	Review Type	Study Population	Review Objective	Key Results
		whilst those aimed at the general population or groups such as school children were designed to promote positive behaviours (e.g. healthy eating).		
Lancet. 2010 Oct 9;376(9748):1261-71. Use of mass media campaigns to change health behaviour. Wakefield MA, Loken B, Hornik RC.	Review		Discusses the outcomes of mass media campaigns in the context of various health-risk behaviours (e.g., use of tobacco, alcohol, and other drugs, heart disease risk factors, sex-related behaviours, road safety, cancer screening and prevention, child survival, and organ or blood donation.	Mass media campaigns can produce positive changes or prevent negative changes in health-related behaviours across large populations. The authors assess what contributes to these outcomes, such as concurrent availability of required services and products, availability of community-based programmes, and policies that support behaviour change. They propose areas for improvement, such as investment in longer better-funded campaigns to achieve adequate population exposure to media messages.
J Health Commun. 2011 Aug;16 Suppl 2:82-93. Who's afraid of non-communicable diseases? Raising awareness of the effects of non-communicable diseases on global health.Alleyne G, Basu S, Stuckler D.	Review		The authors review the role of fear in global health by focusing on the leading global cause of death and disability: non-communicable diseases.	Reviewing mixed evidence about the effects of fear on social change (on individual behaviours and on building a mass movement to achieve collective action), the authors conclude by setting out an evidence-based, marketing strategy to generate a sustained, rational response to the non-communicable disease epidemic.
Br J Health Psychol. 2010 Nov;15(Pt 4):797-824. Epub 2010 Jan 28. Demographic and attitudinal determinants of protective behaviours during a pandemic: a review. Bish A, Michie S.	Review	Web of Science and PubMed databases were searched for references to papers on severe acute respiratory syndrome, avian influenza/flu, H5N1, swine influenza/flu, H1N1, and pandemics. Forward searching of the identified references was also carried out. In addition, references were gleaned from an expert panel of the Behaviour and Communications sub-group of the UK Scientific Pandemic Influenza Advisory Group. Papers were included if they reported associations between demographic factors, attitudes, and a behavioural measure (reported, intended, or actual behaviour).	To identify the key demographic and attitudinal determinants of three types of protective behaviour during a pandemic: preventive, avoidant, and management of illness behaviours, in order to describe conceptual frameworks in which to better understand these behaviours and to inform future communications and interventions in the current outbreak of swine flu and subsequent influenza pandemics.	The research shows that there are demographic differences in behaviour: being older, female and more educated, or non-White, is associated with a higher chance of adopting the behaviours. There is evidence that greater levels of perceived susceptibility to and perceived severity of the diseases and greater belief in the effectiveness of recommended behaviours to protect against the disease are important predictors of behaviour. There is also evidence that greater levels of state anxiety and greater trust in authorities are associated with behaviour.
Gesundheitswesen. 2009 Jun;71(6):351-7. Epub 2009 Jun 15.	Abstract only – review	The reports and papers published in the SARSControl	Summary of findings from three year project.	A lack of knowledge and delayed international communication resulted in the rapid spread of SARS, highlighting the importance of a global system for rapid

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[Prevention and control of infectious diseases with pandemic potential: the EU-project SARSControl]. [Article in German] Ahmad A, Krumkamp R, Richardus JH, Reintjes R.		project form the basis of this article. In addition, a literature search for SARS and pandemic influenza was conducted and information on pandemic planning and management guidelines obtained from the WHO and EU websites. The project results are discussed in this context.		and transparent information transfer. Epidemiological and economic modelling studies have shown that, in comparison to travel restrictions, applying intervention measures to interrupt local transmission within a country and investing into vaccine research and anti-viral stock piling, is a more cost-effective and efficient use of resources for the containment of pandemics. A study investigating the perceived threat associated with pandemics showed that the subjective risk perception of people varies among countries. This influences human behaviour and should hence be considered during risk communication and implementation of pandemic control measures.
Philos Trans R Soc Lond B Biol Sci. 2011 Dec 12;366(1583):3478-90. Why disgust matters. Curtis V.	Review		To consider role of disgust as a disease avoidance mechanism.	This paper argues that a better understanding of disgust, using the new synthesis, offers practical lessons that can enhance human flourishing. Disgust also provides a model system for the study of emotion, one of the most important issues facing the brain and behavioural sciences today.
BMC Infect Dis. 2011 Jan 4;11:2. Sources, perceived usefulness and understanding of information disseminated to families who entered home quarantine during the H1N1 pandemic in Victoria, Australia: a cross-sectional study. Kavanagh AM, Bentley RJ, Mason KE, McVernon J, Petrony S, Fielding J, LaMontagne AD, Studdert DM.	Review	Australian school children and their families	To examine whether compliance with quarantine recommendations was associated with understanding and the type of information source used.	Voluntary home quarantine of cases and close contacts was the main non-pharmaceutical intervention used to limit transmission of pandemic (H1N1) 2009 influenza (pH1N1) in the initial response to the outbreak of the disease in Australia. The effectiveness of voluntary quarantine logically depends on affected families having a clear understanding of what they are being asked to do. Information may come from many sources, including the media, health officials, family and friends, schools, and health professionals. The authors report the extent to which families who entered home quarantine received and used information on what they were supposed to do. Specifically, they outline their sources of information; the perceived usefulness of each source; and associations between understanding of recommendations and compliance.
Journal of American College Health Volume 60, Issue 1, 1 January 2012, Pages 46-56 H1N1 preventive health behaviours in a university setting (Review) Katz, R.a , May, L.b, Sanza, M.a, Johnston, L.a, Petinaux, B.b	Review	American study of university students	to better understand how students perceived their susceptibility to and the severity of H1N1, which preventive behaviours they engaged in, and if policies impacted their preventive health decisions.	Preventive health behavior messaging had a mixed impact on students. Students made simple behavior changes to protect themselves from H1N1, especially if they perceived a high personal risk of contracting H1N1. Although policies were instituted to enable students to avoid classes when ill, almost no student self-isolated for the entire duration of their illness.
Gordon, R., The effectiveness of social marketing interventions for health improvement : what's the evidence? 2006.	Systematic review	3 reviews included	To review the effectiveness of social marketing interventions designed to improve diet, increase physical activity, and tackle substance misuse.	The reviews provide evidence that social marketing interventions can be effective in improving diet, i increasing exercise, and tackling the misuse of substances like alcohol, tobacco, and illicit drugs. There is evidence that social marketing interventions can work with a range of target groups, in different settings, and can work upstream as well as with individuals. CONCLUSIONS: Social marketing provides a very promising framework for improving health both at the individual level and at wider environmental and policy-levels. Problems with research design, lack of conceptual understanding or implementation are valid research concerns.
Oliver, Adam and Brown, Lawrence D. A consideration of user financial incentives to address health				The authors try to address whether the user financial incentives can be used to reduce the health inequalities in the contexts of the United Kingdom and the United States. They conclude payments for some aspects of medical adherence may offer a promising way to address,

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inequalities. *Journal of Health Politics, Policy and Law 2012; 37 (2): 201-226 (April 2012)*				to some extent, inequalities in health and health care in both countries. However, payments for more sustained behavior change, such as that associated with smoking cessation and weight loss, have thus far shown little long-term effect, although more research that tests the effectiveness of different incentive mechanism designs, informed by the findings of behavioral economics, ought to be undertaken. The article also reviews some of the practical, political, ethical, and ideological objections which can be waged against user financial incentives in health.
Thompson, L. and A. Kumar, Responses to health promotion campaigns: resistance, denial and othering. 2011.			Drawing on data generated in focus groups, this article explores the themes of resistance, and denial	A wide variety of health promotion strategies are employed which are designed to educate members of the public with the ultimate goal of gradual general cultural change and individual behaviour change. The object is a closer alignment of individual and population health-related behaviours with 'ideal' notions of what a healthy citizen might be. These campaigns are not taken up in any straightforward way, but people negotiate the messages in complex and sometimes contradictory ways. This article also identifies an unintended consequence that may arise from processes of othering that may serve to reinforce stigmatisation and inequality rather than mitigating it.
Cheung, Ronny and Ardolino, Antonella Behavioural science in public health policy. *British Journal of Healthcare Management 2011; 17 (4): 140-144 (April 2011)*	Commentary/review		Review of the science behind 'nudge', and commentary on why should clinicians and hospital managers be interested in it.	
Michie, Susan, et al. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implementation Science 2011; 6 (42): (23 April 2011)*	Systematic review	A systematic search of electronic databases and consultation with behaviour change experts were used to identify frameworks of behaviour change interventions.	Evaluation of frameworks for characterising interventions and linking them to an analysis of the targeted behaviour.	Interventions and policies to change behaviour can be usefully characterised by means of a BCW comprising: a 'behaviour system' at the hub, encircled by intervention functions and then by policy categories. Research is needed to establish how far the BCW can lead to more efficient design of effective interventions.
Deutekom, Marije and Vansenne, Fleur The effects of screening on health behaviour : a summary of the results of randomized controlled trials. *Journal of Public Health 2011; 33 (1): 71-79 (March 2011)*	Systematic review		To summarize evidence of the effects of screening, either risk factor screening or screening for early detection of disease, on health behaviour: smoking habits, diet, exercise, alcohol consumption and adherence to guidelines for healthy living.	The number of trials studying the effect of population-based screening programmes on health behaviour is limited. The trials on screening for risk factors suggest a positive effect on health behaviour, while the number of trials on screening for early detection of disease was too low to draw conclusions on subsequent health behaviour. Future RCTs of screening interventions should systematically include health behaviour effects in their study design.
Rosser, Benjamin A. Technologically-assisted behaviour change : a systematic review of studies of novel technologies for the management of chronic illness. *Journal of Telemedicine and Telecare 2009; 15 (7): 327-338*	Systematic review	A total of 45 articles reporting 33 separate interventions met the inclusion/exclusion criteria and were reviewed in detail.	To investigate the use of technology in achieving behaviour change in chronic illness.	The areas reviewed were: (1) methods employed to adapt traditional therapy from a face-to-face medium to a computer-assisted platform; (2) targets of behaviour change; and (3) level of human (e.g. therapist) involvement.
Prematunge C, Corace K, McCarthy A, Nair RC,	Systematic review	A comprehensive review of literature	This systematic review aims To	Many of the factors that influenced HCW pandemic vaccination decisions have previously been reported

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Pugsley R, Garber G. Factors influencing pandemic influenza vaccination of healthcare workers--a systematic review. Vaccine. 2012 Jul 6;30(32):4733-43. Epub 2012 May 27		(MEDLINE, PubMed, EMBASE, PsycINFO, CINHAL, AMED, Cochrane Library, ProQuest, and grey literature sources) published between January 2005 and December 2011 to identify studies relevant to HCW pH1N1 vaccine uptake/refusal.	inform future influenza vaccine interventions and pandemic planning processes via the examination of literature in HCW H1N1 vaccination, in order to identify factors that are (1) unique to pandemic influenza vaccination and (2) similar to seasonal influenza vaccination research.	in seasonal influenza vaccination literature, but some factors were unique to pandemic vaccination. Future influenza vaccine campaigns should emphasize the benefits of vaccination and highlight positive cues to vaccination, while addressing barriers to vaccine uptake in order to improve vaccine coverage among HCW populations. Since pandemic vaccination factors tend be similar among different HCW groups, successful pandemic vaccination strategies may be effective across numerous HCW populations in pandemic scenarios
Michie, S. Low-income groups and behaviour change interventions: a review of intervention content, effectiveness and theoretical frameworks**.** *Journal of Epidemiology and Community Health 2009; 63 (8): 610-622 (August 2009)*	Review	Of 9,766 papers identified by the search strategy, 13 met the inclusion criteria.	Investigated the effectiveness of interventions targeting low-income groups to reduce smoking or increase physical activity and/or healthy eating.	This review shows that behaviour change interventions, particularly those with fewer techniques, can be effective in low-income groups, but highlights the lack of evidence to draw on in informing the design of interventions for disadvantaged groups.
Velan B. Acceptance on the move: public reaction to shifting vaccination realities Hum Vaccin. 2011 Dec;7(12):1261-70. Epub 2011 Dec 1.	Review	UK	This review examines four events related to vaccination that have occurred in recent years: (a) The ongoing recovery from the MMR/Autism scare in the UK (b) The upgrading of the Varicella vaccine to a universal childhood vaccine (c) The major effort of authorities to provide a vaccine for A/H1N1 influenza and its rejection by the public, and, d) The current attempts to change the HPV vaccine target from girls only to boys and girls.	Looks at how changes have been met with shifts in the public acceptance of the relevant vaccine. These shifts are characterized not only by the number of people willing to be vaccinated, but also by the attitudes and the motives related to acceptance. Examination of the inter-relationship between changes in vaccination realities, and changes in acceptance patterns suggests that today, the public has a better understanding of vaccination, is acting in a more reflexive way, and is capable of changing attitudes and behavior. All together, changes in vaccination enhance debates and dialogues about vaccines, and lead to higher awareness and more conscious acceptance.
Kings Fund, 2008 Low income groups and behaviour change Authors S Michie, K Jochelson, W Markham, C Bridle www.kingsfund.org.uk	Systematic review of interventions according to component techniques	Low income groups	The paper reviews interventions to quit smoking or promote healthy eating or physical activity that are specifically targeted at low-income groups.	It analyses interventions according to their component techniques. It finds that interventions can be effective in low-income groups, and that the most frequently used techniques are providing information and encouraging people to set goals. These may be particularly effective in disadvantaged groups as their knowledge and skills base may be lower. The techniques may be complementary: providing information about the benefits of changing behaviour may increase people's motivation to change, while helping people to form specific, realistic goals may help them to translate motivation into action.
Alleyne G, Basu S,	Theoretical		Review the role of	After reviewing mixed evidence about the effects

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Stuckler D. Who's afraid of non communicable diseases? Raising awareness of the effects of non communicable diseases on global health. J Health Communication. 2011 Aug; 16 Suppl 2:82-93.	review		fear in global health by focusing on the leading global cause of death and disability: non-communicable diseases. Taking an historical perspective, first the authors review Samuel Adams' 1911 analysis of the role of fear in generating public health priority and his recommendations about mass educating the public.	of fear on social change (on individual behaviours and on building a mass movement to achieve collective action), the authors conclude by setting out an evidence-based, marketing strategy to generate a sustained, rational response to the non-communicable disease epidemic.
Hill S, Mao J, Ungar L, Hennessy S, Leonard CE, Holmes J. Natural supplements for H1N1 influenza: retrospective observational infodemiology study of information and search activity on the Internet. J Med Internet Res. 2011 May 10;13(2):e36.	Retrospective review	A retrospective observational infodemiology study of indexed websites and Internet search activity over the period January 1, 2009, through November 15, 2009. The setting is the Internet as indexed by Google with aggregated Internet user data. The main outcome measures were the frequency of "hits" or webpages containing terms relating to natural supplements co-occurring with H1N1/swine flu, terms relating to natural supplements co-occurring with H1N1/swine flu proportional to all terms relating to natural supplements, webpage rank, webpage entropy, and temporal trend in search activity.	To identify and characterize websites that provide information about herbal and natural supplements with information about H1N1 and to examine trends in the public's behavior in searching for information about supplement use in preventing or treating H1N1.	The prevalence of non-authoritative web pages with information about supplements in the context of H1N1/swine flu and the increasing number of searches for these pages suggest that the public is interested in alternatives to traditional prevention and treatment of H1N1. The quality of this information is often questionable and clinicians should be cognizant that patients may be at risk of adverse events associated with the use of supplements for H1N1.
Bults M, Beaujean DJ, de Zwart O, Kok G, van Empelen P, van Steenbergen JE, Richardus JH, Voeten HA. Perceived risk, anxiety, and behavioural responses of the general public during the early phase of the Influenza A (H1N1) pandemic in the Netherlands: results of three consecutive online surveys. BMC Public Health. 2011 Jan 3;11:2.	Review of survey data	Netherlands	The aim of this study was to examine perceptions and behaviours of the general public during the early phase of the Influenza A (H1N1) pandemic in the Netherlands.	RESULTS: Between May and August 2009, the level of knowledge regarding Influenza A (H1N1) increased, while perceived severity of the new flu, perceived self-efficacy, and intention to comply with preventive measures decreased. The perceived reliability of information from the government decreased from May to August (62% versus 45%). Feelings of anxiety decreased from May to June, and remained stable afterwards. From June to August 2009, perceived vulnerability increased and more respondents took preventive measures (14% versus 38%). Taking preventive measures was associated with no children in the household, high anxiety, high self-efficacy, more agreement with statements on avoidance, and paying much attention to media information regarding Influenza A (H1N1). Having a strong intention to comply with government-advised preventive measures in the future was associated with higher age, high

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				perceived severity, high anxiety, high perceived efficacy of measures, high self-efficacy, and finding Governmental information to be reliable. CONCLUSIONS: Decreasing trends over time in perceived severity and anxiety are consistent with the reality: the clinical picture of influenza turned out to be mild in course of time. Although (inter)national health authorities initially overestimated the case fatality rate, the public stayed calm and remained to have a relatively high intention to comply with preventive measures.
Freiman AJ, Montgomery JP, Green JJ, Thomas DL, Kleiner AM, Boulton ML. Did H1N1 influenza prevention messages reach the vulnerable population along the Mississippi Gulf Coast? J Public Health Management Practice. 2011 Jan-Feb;17(1):52-8.	Review of efficacy of communications campaign	USA – Mississippi vulnerable populations	To identify the primary sources of information utilized by a vulnerable population during the 2009 Influenza pandemic and examine disease prevention behaviours related to reports of local H1N1 influenza transmission.	The Centres for Disease Control and Prevention's emphasis on providing health information about H1N1 primarily through the Internet may not have been effective in reaching the public. Provision of health messages through various mediums, especially television, may better inform the public of disease-related prevention messages during a developing influenza pandemic.
Balinska M, Rizzo C. Behavioural responses to influenza pandemics: what do we know? PLoS Curr. 2009 Sep 9;1:RRN1037	Review of previous pandemic episodes	This paper reviews the relevant scientific literature for the 1918-1920, 1957-1958, 1969-1969 influenza epidemics and the 2003 SARS outbreak.	Although the epidemiological aspects of the three 20th century influenza pandemics have been widely investigated, little is known about population behaviour in a pandemic situation. Such knowledge is however critical, notably for predicting population compliance with non pharmaceutical interventions.	Although the evidence base of most non pharmaceutical interventions (NPIs) and personal protection measures is debated, it appears on the basis of past experience that NPIs implemented the most systematically, the earliest, and for the longest time could reduce overall mortality rates and spread out epidemic peaks. Adequate, transparent, and targeted communication on the part of public health authorities would be also of crucial importance in the event of a serious influenza pandemic.
Quinn SC, Kumar S, Freimuth VS, Kidwell K, Musa D. Public willingness to take a vaccine or drug under Emergency Use Authorization during the 2009 H1N1 pandemic. Bio-security Bio-terror. 2009 Sep;7(3):275-90.	Review	An internet survey with 1,543 adults from a representative sample of the U.S. population with 2 over samples of African Americans and Spanish-speaking Hispanics. Our completion rate was 62%.	Explores the public's willingness to use a drug or vaccine under the conditions stipulated in the FDA's nonbinding guidance regarding EUAs.	Results provide insights into the challenges of communicating about EUA drugs and vaccine in our current pandemic.
Branson, Chris, et al. Ipsos MORI. Social Research Institute Acceptable behaviour? : public opinion on behaviour change policy. London : Ipsos MORI, 2012 *Web publication* http://www.ipsos-mori.com/DownloadPublication/1454_sri-ipsos-mori-acceptable-behaviour-january-2012.pdf	Review	International research	Considers the public acceptability of a range of measures intended to change behaviour across four policy areas	Investigates support for different levels of political Intervention in the lives of individuals with regard to: smoking; eating unhealthy foods; saving for retirement; and living in an environmentally sustainable way.

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Goudie, Robert J. B., et al. London School of Economics. Centre for Economic Performance Happiness as a driver of risk-avoiding behaviour. CEP discussion paper ; 1126 (February 2012) London : LSE, 2012 *Web publication*			Most governments try to discourage their citizens from taking extreme risks with their health and lives. Yet, for reasons not understood, many people continue to do so.	Shows that expected-utility theory predicts that 'happier' people will be less attracted to risky behaviours. Second, using BRFSS data on seatbelt use in a sample of 300,000 Americans, it documents evidence strongly consistent with that prediction. The result is demonstrated with various methodological approaches, including Bayesian model-selection and instrumental-variable estimation (based on unhappiness caused by widowhood). Third, using data on road accidents from the Add Health data set, it finds strongly corroborative longitudinal evidence. These results suggest that government policy may need to address the underlying happiness of individuals rather than focus on behavioural symptoms. http://cep.lse.ac.uk/pubs/download/dp1126.pdf