Applying and Building Theory for Behaviour Change

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This session
1. Introduction to
   – the Behaviour Change Wheel
   – the Theoretical Domains Framework
2. Application to implementation problem
   – identify intervention functions and policies
   – select behaviour change techniques for the intervention

Introduction
• Applying behavioural science
  – Understanding behaviour in context as the starting point for interventions
  – The importance of theory
  – A systematic method for designing interventions to change behaviour
Effective interventions
- Intervene at many levels
- simultaneously & consistently

Community-level
Population-level
Individual-level

How to improve interventions?
- Understand effective interventions
  - why they vary across behaviour, population and setting (moderators)
  - their mechanisms of action (mediators)
- This requires
  - a theoretical understanding
    - Not just whether they were effective, but why
  - knowing what the intervention was
    - Precise specification of its content
- Designing more effective interventions
  - A systematic method informed by theory

TIDieR: Template for Intervention Description and Replication (Hoffman et al, BMJ, 2014)

- WHY: rationale, theory
- WHAT: Materials and procedure
- WHO PROVIDED
- HOW: Mode of delivery
- WHERE
- WHEN and HOW MUCH
- TAILORING
- MODIFICATIONS: during the course of the study
- HOW WELL: Planned (inc assessment of fidelity) and actual delivery
Theory: MRC Guidance for developing and evaluating complex interventions  
Craig et al, 2009 BMJ

**Theory:**
MRC Guidance for developing and evaluating complex interventions

**Theory:**
A set of concepts and/or statements which specify how phenomena relate to each other.

**Theory:**
Theory provides an organizing description of a system that accounts for what is known, and explains and predicts phenomena.
Applying theory to intervention design and evaluation: Why?

• Provides a framework to facilitate
  – accumulation of evidence
  – communication across research groups
• Identifies barriers and facilitators to change
  – and what needs to change
• Identifies mechanisms of action
  – evidence that can be used to
    • understand processes
    • design and improve interventions

Applying theory to intervention design and evaluation

• Apply formal theory
  – 83 theories of behaviour change identified in cross-disciplinary review
  – Theory Coding Scheme
    • Michie & Prestwich, 2010, Health Psych

OR

• Use an integrative theoretical framework
  – Behaviour Change Wheel, Michie et al, 2011
  – Theoretical Domains Framework, Cane et al, 2012

Applying the Behaviour Change Wheel to intervention design

• Start by understanding target behaviour in context
  • COM-B model
• Then link to
  • intervention functions,
  • policies,
  • behaviour change techniques
Understand the behaviour in context

- Why are behaviours as they are?
- What needs to change for the desired behaviour/s to occur?

- Answering this is helped by a model of behaviour – COM-B

A thought experiment

For behaviour to change, what three conditions need to exist?

The COM-B system: Behaviour occurs as an interaction between three necessary drivers

- Capability: Psychological or physical ability to enact the behaviour
- Motivation: Reflective and automatic mechanisms that activate or inhibit behaviour
- Opportunity: Physical and social environment that enables the behaviour

Michie, van Stralen and West (2011) Implementation Science
Designing effective interventions

1. Understand the behaviour you are trying to change
   – Make a “behavioural diagnosis”
2. Consider the full range of options open to you
3. Use a systematic method for selecting behaviour change techniques
4. Evaluate interventions so it is possible to accumulate evidence to inform future interventions

Start with understanding the behaviour in context

Elaboration of COM-B: Theory Domains Framework

- To make theory more usable for implementation researchers
  – 18 researchers in health psychology
  – 14 implementation researchers from UK, Netherlands and Canada
- Generated and synthesised 33 theories and 128 constructs ....
- into 14 domains (11 originally)

Cane et al (2011) Validation of the theoretical domains framework for use in behaviour change and implementation research, Implementation Science
Example: GPs managing low back pain: 

**Australia**

The implementation problem:
1. Too frequent referral for lumbar X-rays
2. Too infrequent recommendation to stay active

Used the Theory Domains Framework

- Comprehensive theoretically-based “diagnosis” of the implementation problem
- Provides basis for designing intervention

French, Green, O’Connor, MacKenzie, Francis, Michie, Buchbinder, Schattner, Spike, Grimshaw.


Assessing the problem

- Theoretical assessment of implementation problem
- Theory domain questions about the 2 GP behaviours
- 11 Focus Groups of 42 GPs
- Thematic analysis: barriers & enablers, GP & patient perspectives

Intervention development:
Matrix of domains and techniques

Evaluation in cluster RCT

Interviews: Domains in which problems identified
Survey: Domains predicting intention to manage patients without x-ray

Beliefs about capabilities
0.21 (0.11, 0.32), p=0.000

Beliefs about consequences
0.18 (0.07, 0.29), p=0.033

Social influences
0.20 (0.12, 0.28), p=0.000

Professional role
0.44 (0.30, 0.57), p=0.000

Domain predicting intention to manage behaviour

Domains predicting intention to advise patients to stay active

Beliefs about capabilities
0.24 (0.15, 0.33), p=0.000

Beliefs about consequences
0.12 (0.04, 0.25), p=0.003

Social influences
0.10 (0.02, 0.19), p=0.011

Professional role
0.21 (0.10, 0.32), p=0.000

Environment
0.00 (0.00, 0.10), p=0.85

Knowledge
0.03 (0.07, 0.15), p=0.67

Memory
0.17 (0.05, 0.30), p=0.037

Domain predicting intention to advise behaviour

Using theory to develop interventions
Sample of interventions using this approach

Australia
• Improving implementation of guidelines for acute low back pain in primary care – McKenzie et al.
• Diagnosis and post-diagnosis management of people with dementia – Green et al.
• Implementing preconception care guidelines in the general practice setting – Mazza et al.

Canada
• Chiropractors compliance with diagnostic imaging guideline recommendations for spine disorders – Bussieres et al.

Finland
• Guidelines on tobacco and nicotine dependency treatment – Kinnunan et al.

Ireland
• Primary care practitioners’ HPV-related behaviours – McSherry et al.

Netherlands
• Blood transfusion management in elective hip and knee arthroplasties – Voorn et al.

UK
• Physicians’ transfusion practice – Eccles et al.
• Hospital staff hand hygiene – Sheldon et al.
• A suite of dental guidelines across Scotland – Clarkson et al.

Practical exercise 1

• Implementation problem: Primary care providers not referring patients to DPP
• What needs to shift?
  – COM-B/ Theoretical Domains Framework
• What are likely to be needed to create the shift?
  – intervention functions and policy categories

[materials needed – print out of the Behaviour Change Wheel; list of TDF domains]
A theoretical basis for designing effective interventions

1. Understand the behaviour you are trying to change
   - Make a theory-based “behavioural diagnosis”
2. Consider the full range of options open to you
3. Use a systematic method to select behaviour change techniques
4. Evaluate interventions so it is possible to accumulate evidence to inform future interventions

Start with understanding the behaviour in context

Consider the full range of options: frameworks are helpful

- Need a framework that is
  - Comprehensive
    - So you don't miss options that might be effective
  - Coherent
    - So you can have a systematic method for intervention design
  - Linked to a model of behaviour
    - So you can draw on behavioural science
Do we have such a framework?

- Systematic literature review identified 19 frameworks of behaviour change interventions related to health, environment, culture change, social marketing etc.
- None met all these three criteria
- So …. Developed a synthesis of the 19 frameworks

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### Frameworks included in systematic review

1. **Epicure taxonomy** West (2006) Taxonomy of approaches designed to influence behaviour patterns
2. **Culture capital framework** Knott et al. (2008) Framework of knowledge about culture change, offering practical tools for policymaking
3. **EPOC taxonomy of interventions** Cochrane Effective Practice and Organisation of Care Review Group (EPOC) (2010) Checklist to guide systematic literature reviewers about the types of information to extract from primary studies
4. **RURU: Intervention implementation taxonomy** Walter et al. (2003) Taxonomy covering a wide range of policy, practice and organisational targets aimed at increasing impact of research
5. **MINDSPACE** Institute for Government and Cabinet Office (2010) Checklist for policy makers aimed at changing or shaping behaviour
6. **Taxonomy of behaviour change techniques** Abraham et al. (2010) Taxonomy of behaviour change techniques grouped by change targets
8. **People and places framework** Maibach et al. (2007) Framework that explains how communication and marketing can be used to advance public health
10. **Injury control framework** Galler et al. (1990) Heuristic framework for categorising and evaluating behaviour change strategies aimed at controlling injuries
11. **Implementation taxonomy** Leeman et al. (2007) Theory-based taxonomy of methods for implementing change in practice
12. **Legal framework** Purdie et al. (2005) Conceptual framework for identifying possible legal strategies used for preventing cardiovascular diseases
13. **PETeR** White (in prep.) Comprehensive and universally applicable model or taxonomy of health
14. **DEFRA’s 4E model** DEFRA (2008) Process model for policy makers aimed at promoting pro-environmental behaviours in accordance with social marketing principles
15. **STD/HIV framework** Cohen and Scribner (2000) Taxonomy to expand the scope of interventions that can be used to prevent STD and HIV transmission
16. **Framework on public policy in physical activity** Dunton et al. (2010) Taxonomy aimed at understanding how and why policies successfully impact on behaviour change
17. **Intervention framework for retail pharmacies** Goel et al. (1996) Framework that presents factors that may affect retail pharmacy describing and strategies for behaviour change to improve appropriateness of prescribing
18. **Environmental policy framework** Vlek (2000) A taxonomy of major environmental problems, their different levels and global spheres of impact, and conceptual modeling of environmental problem-solving
Interventions: activities designed to change behaviours

- Using rules to reduce the opportunity to engage in the behaviour (or to increase behaviour by reducing opportunity to engage in competing behaviours)
- Increasing knowledge or understanding
- Using communication to induce positive or negative feelings to stimulate action
- Creating an expectation of reward
- Creating an expectation of punishment or cost
- Imparting skills
- Increasing means or reducing barriers to increase capability (beyond education or training) or opportunity (beyond environmental restructuring)
- Changing the physical or social context
- Provide an example for people to aspire to or emulate
### Policy categories

<table>
<thead>
<tr>
<th>Policy category</th>
<th>Example</th>
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<tr>
<td>Communication/marketing</td>
<td>Using print, electronic, telephonic or broadcast media marketing</td>
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<td>Conducting mass media campaigns</td>
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<td>Guidelines</td>
<td>Creating documents that recommend or mandate practice. This includes all</td>
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<td>changes to service provision</td>
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<td>Producing and disseminating treatment protocols</td>
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<td>Fiscal</td>
<td>Using the tax system to reduce or increase the financial cost</td>
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<td>Increasing duty or increasing anti-smuggling activities</td>
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<td>Regulation</td>
<td>Establishing rules or principles of behaviour or practice</td>
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<td>Establishing voluntary agreements on advertising</td>
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<td>Legislation</td>
<td>Making or changing laws</td>
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<td>Prohibiting sale or use</td>
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<td>Environmental/social planning</td>
<td>Designing and/or controlling the physical or social environment</td>
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<td>Using town planning</td>
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<td>Service provision</td>
<td>Delivering a service</td>
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<td>Establishing support services in workplaces, communities etc.</td>
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Use the Behaviour Change Wheel to …

1. Design interventions and policies
2. “Retrofit” – identify what is in current interventions and policies
3. Provide a framework for evaluation – How are interventions working?
4. Structure systematic reviews

Which intervention functions should be used?

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Given intervention function/s, which techniques?

**Behaviour change techniques (BCTs)**

- “Active ingredients” within the intervention designed to change behaviour
- They are:
  - observable,
  - replicable and
  - irreducible components of an intervention
- Can be used alone or in combination with other BCTs
Considerations when selecting behaviour change techniques: The APEASE criteria

- Affordability
- Practicability
- Effectiveness/cost-effectiveness
- Acceptability
  - public
  - professional
  - political
- Side-effects/safety
- Equality

Use the Behaviour Change Wheel to …

1. “Retrofit” – identify what is in current interventions and policies
2. Provide a framework for evaluation
   - How are interventions working?
3. Structure systematic reviews
4. Design interventions and policies
BCW used in very varied ways ... 2013

- International Red Cross to train volunteers
- Projects to improve paediatric health care in Kenya
- A method for improving colorectal screening practices in the USA
- An organisational intervention tool in the Netherlands
- A weight management clinic in the UK
- An internet intervention to improve condom use

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**Practical exercise 2**

- Implementation problem: *Primary care providers not referring patients to DPP*
- Following your behavioural analysis from Practical Exercise 1 (COM-B/TDF), what are likely to be needed to increase referral rates?
  - intervention functions and policy categories
  - [behaviour change techniques]

[materials needed – print out of the Behaviour Change Wheel]

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![Behaviour Change Wheel](image)
Acknowledgements

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  - Prof Robert West, UCL
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  - Health Psychology Research Group

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For more information ...

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