The journey of research translation

- Motivation
- Training
- Choosing the right area, right question, time and approaches
- Funding
- Outputs – the dissemination, pathways to impact boxes
- Is it all a fiction?
- How does it all work?
Multidisciplinary

Source: Dahlgren and Whitehead, 1991
What is needed for translation?

- Do good, robust research that adheres to highest principles
- Evidence, evidence, evidence
- Publish
- Develop relationships over time, use those that exist
- Take up opportunities for leadership from wherever you are (blogs, panels etc)
- Continue to adhere to highest principles
- Identify levers that can mobilise finance, services, interventions
- Influencing legal frameworks, local, national and/or supranational levels
- Read the runes on the right time, right place, right evidence
- Advocacy and evidence, a contentious area
Pathways to impact (from across the network)

Impacting the National Debate on Obesity

The case for public health policy engagement – a series of case studies

Professor Theresa Marteaux and her team at the Behaviour and Cochrane systematic review producing the most conclusive evdidence to national and international efforts to achieve sustainable outputs and reduce health inequalities. The unit focuses on alcohol, inactivity and smoking, as changing these behaviours majority of the preventable non-communicable diseases, inclu disease and diabetes.

After conducting scoping exercises, the unit realised that there portion, package and tableware sizes which of significant brought together. During the course of over two years, the tea review, which was published in September 2015. This review: entitled downsizing: What are the Policy Options for Reducing

The review evidence showed that people consume more food a larger portions, packaging or tableware rather than smaller side gender, BMI or self-control. Although perhaps an intuitive find the best evidence to show this. The review’s findings suggest 1 packages and tableware may present a potential path for help, quarter of British adults, cooking times, quality of life and the N

Strategy

The team chose their review topic specifically because of its re

In 2010, the NHS estate in England comprised 30 million square metres, including acute hospitals with a floor space of 18.83 million square metres. In 2008, the N contributing 18% of the UK’s non-domestic carbon emissions, and around the 44% of energy use in NHS hospitals was attributed to heating and cooling. Trymin manage air flows and temperatures by installing energy hungry air conditioners w costly and would likely jeopardise carbon reduction targets. For some time it was that large numbers of existing healthcare buildings would have to be demolished to replaced to address these challenges.

Designing Sustainable Healthcare Buildings

The case for public health policy engagement – a series of case studies

Professor Alan Short of the University of Cambridge’s Department of Architecture applied twenty-five years of research on natural ventilation and passive cooling to national and international policy around hospital buildings. His research helps eras existing and future hospitals are resilient to rising temperatures in order to enhance wellbeing, minimise carbon emissions, and protect hospital resources.

Serving as Economic Advisor for the Review on Antimicrobial Resistance

The case for public health policy engagement – a series of case studies

Dr Flavio Toledo is a Lecturer at the University of Cambridge’s Faculty of Economics. From 2014 to 2016 he served as the Economic Advisor for the Government and Wellcome Trust commissioned independent Review on Antimicrobial Resistance. In May 2016 the Review published its 10 recommendations around how we can tackle this worsening global public health crisis.

Situation

Antimicrobials refer to a range of drugs including antibiotics, antifungals, antivirals. AMR occurs when microbes evolve in such a way as to become resistant to our once effective antimicrobials. While AMR is part of a natural evolutionary process, humans are accelerating it, for example through the unnecessary use of antibiotics. AMR is visible across the world, and is already seen in a range of antimicrobials that were once effective in addressing conditions such as HIV, tuberculosis, pneumonia, and urinary tract infections. A study has estimated that in Europe and the US, 50,000 individuals die annually because of AMR, and that the annual global figure is around 700,000. The increasingly dangerous situation is expected to lead to growing fatalities and costs, and some predict that the 2050 AMR will be responsible for 10 million deaths per year – more than currently due from cancer.

As the causes of AMR are varied, the solutions will need to be, as well. A critical part of the puzzle is altering the current incentive structure in which it does not make sense for pharmaceutical companies to invest in creating new effective drugs as it is expensive, the low hanging fruit has been picked, and once new drugs are created we want to use
The journey involves

- Compelling narrative
- Value and impact
- A delicate balance
- Including what is achievable in short time frames
- *human nature – successive promises*
- *lack of reflection in our processes*
- *raising grants continuously without extracting maximum value from what we already have*
- *also seeing where we new research*
Illustration – the story of dementia

- early studies
- middle period studies
- coming together of risk
- societal demand for action
- biomedical world
- loss of the narrative
- recent findings
- partial recapturing of the narrative
Clinical state characterized by a loss of function in multiple cognitive domains in an alert attentive person.

- Alzheimer
- Strokes
- Syphilis
- HIV
- CJD
- nvCJD
- Chr traumatic encephalopathy

- Frontotemporal Dementia
- Lewy Body Disease & Parkinson’s with Dementia
- Huntington’s

& more…

Adapted from L. Chambers
Figure 1. EURODEM Prevalence collaborating centres throughout Europe.
The Cognitive Function and Ageing Studies

Sites in Britain

Newcastle
Liverpool
Gwynedd
Nottingham
Ely
Oxford
Government & charity use of epidemiological data

- Multiple reports starting with government and ageing, long term care
- Dementia UK first report & UN/WHO Healthy ageing initiatives
- Dementia UK 2 (2014)
- Service initiatives – targets for GPs, screening for acute unplanned admissions
- G7/8

- Huge business opportunity – fear, pharma (diagnostics and treatment)
- Investment of ~£0.5bn in pathways to drug discovery
But...cross generational work and CFAS II
Now, to GBD!
- up to age 86, not immortal

**GBD: Leading causes of DALYs 1990 & 2013**

<table>
<thead>
<tr>
<th>Rank 1990</th>
<th>1990 Leading Causes</th>
<th>2013 Leading Causes</th>
<th>Rank 2013</th>
<th>All age rates</th>
<th>Median % change</th>
<th>Age-standardized rates</th>
<th>Median % change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 (1-1)</td>
<td>Ischemic heart disease</td>
<td>1 Low back &amp; neck pain</td>
<td>1.1 (1-2)</td>
<td>19% (13 to 24%)</td>
<td>1% (-4 to 6%)</td>
<td>28 Iron-deficiency anemia</td>
<td></td>
</tr>
<tr>
<td>2.1 (2-3)</td>
<td>Low back &amp; neck pain</td>
<td>2 Ischemic heart disease</td>
<td>1.9 (1-2)</td>
<td>-55% (-58 to -48%)</td>
<td>-65% (-67 to -60%)</td>
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</tr>
<tr>
<td>2.9 (2-3)</td>
<td>Cerebrovascular disease</td>
<td>3 Cerebrovascular disease</td>
<td>3.9 (3-6)</td>
<td>-36% (-41 to -28%)</td>
<td>-50% (-54 to -45%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0 (4-4)</td>
<td>Lung cancer</td>
<td>4 COPD</td>
<td>4.3 (3-7)</td>
<td>-4% (-11 to 6%)</td>
<td>-22% (-28 to -15%)</td>
<td></td>
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</tr>
<tr>
<td>5.1 (5-6)</td>
<td>COPD</td>
<td>5 Lung cancer</td>
<td>4.9 (3-8)</td>
<td>-21% (-28 to -14%)</td>
<td>-37% (-42 to -31%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.6 (6-8)</td>
<td>Falls</td>
<td>6 Alzheimer disease</td>
<td>6.7 (5-10)</td>
<td>33% (12 to 44%)</td>
<td>-2% (-12 to 6%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.7 (6-11)</td>
<td>Lower respiratory infections</td>
<td>7 Sense organ diseases</td>
<td>6.8 (3-11)</td>
<td>17% (12 to 21%)</td>
<td>-7% (-12 to -5%)</td>
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</tr>
<tr>
<td>8.9 (6-14)</td>
<td>Sense organ diseases</td>
<td>8 Depressive disorders</td>
<td>8.8 (3-14)</td>
<td>9% (5 to 15%)</td>
<td>-4% (-7 to 0%)</td>
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<tr>
<td>9.5 (7-12)</td>
<td>Alzheimer disease</td>
<td>9 Falls</td>
<td>9.0 (7-11)</td>
<td>-9% (-20 to 2%)</td>
<td>-26% (-35 to -18%)</td>
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</tr>
<tr>
<td>9.7 (5-17)</td>
<td>Depressive disorders</td>
<td>10 Skin diseases</td>
<td>9.3 (4-14)</td>
<td>8% (3 to 12%)</td>
<td>-3% (-8 to 0%)</td>
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</tr>
<tr>
<td>9.9 (6-16)</td>
<td>Skin diseases</td>
<td>11 Diabetes</td>
<td>10.6 (8-13)</td>
<td>45% (28 to 63%)</td>
<td>20% (6 to 35%)</td>
<td></td>
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<tr>
<td>12.1 (9-14)</td>
<td>Colorectal cancer</td>
<td>12 Lower respiratory infections</td>
<td>12.5 (5-16)</td>
<td>-16% (-29 to -10%)</td>
<td>-37% (-48 to -33%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.1 (9-16)</td>
<td>Breast cancer</td>
<td>13 Chronic kidney disease</td>
<td>14.0 (10-19)</td>
<td>10% (5 to 14%)</td>
<td>-9% (-12 to -5%)</td>
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<tr>
<td>14.2 (12-17)</td>
<td>Road injuries</td>
<td>14 Colorectal cancer</td>
<td>15.1 (12-18)</td>
<td>-16% (-23 to -11%)</td>
<td>-33% (-38 to -29%)</td>
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<tr>
<td>16.1 (12-20)</td>
<td>Chronic kidney disease</td>
<td>15 Migraine</td>
<td>15.5 (10-22)</td>
<td>10% (-1 to 21%)</td>
<td>-2% (-12 to 8%)</td>
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<tr>
<td>17.0 (14-20)</td>
<td>Diabetes</td>
<td>16 Other musculoskeletal</td>
<td>16.4 (12-21)</td>
<td>27% (21 to 32%)</td>
<td>6% (2 to 9%)</td>
<td></td>
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</tr>
<tr>
<td>17.6 (15-20)</td>
<td>Congenital anomalies</td>
<td>17 Anxiety disorders</td>
<td>16.8 (10-28)</td>
<td>12% (6 to 16%)</td>
<td>0% (-1 to 1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.7 (10-25)</td>
<td>Migraine</td>
<td>18 Breast cancer</td>
<td>17.0 (13-21)</td>
<td>-24% (-30 to -14%)</td>
<td>-40% (-45 to -32%)</td>
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</tr>
<tr>
<td>18.8 (15-22)</td>
<td>Self-harm</td>
<td>19 Other cardiovascular</td>
<td>18.2 (15-22)</td>
<td>22% (-24 to 51%)</td>
<td>-3% (-40 to 21%)</td>
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<tr>
<td>19.2 (10-30)</td>
<td>Anxiety disorders</td>
<td>20 Drug use disorders</td>
<td>20.2 (18-23)</td>
<td>27% (5 to 37%)</td>
<td>19% (-2 to 28%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.4 (16-26)</td>
<td>Other musculoskeletal</td>
<td>21 Congenital anomalies</td>
<td>20.5 (17-23)</td>
<td>-18% (-26 to -7%)</td>
<td>-28% (-36 to -17%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.1 (18-25)</td>
<td>Other cardiovascular</td>
<td>22 Oral disorders</td>
<td>20.8 (14-27)</td>
<td>10% (6 to 14%)</td>
<td>-9% (-12 to -5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.4 (20-25)</td>
<td>Neonatal preterm birth</td>
<td>23 Neonatal preterm birth</td>
<td>24.7 (22-30)</td>
<td>-18% (-32 to -3%)</td>
<td>-26% (-39 to -10%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.4 (17-29)</td>
<td>Oral disorders</td>
<td>24 Self-harm</td>
<td>25.5 (22-30)</td>
<td>-36% (-43 to -24%)</td>
<td>-43% (-50 to -32%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.0 (21-29)</td>
<td>Drug use disorders</td>
<td>25 Iron-deficiency anemia</td>
<td>25.5 (21-33)</td>
<td>8% (2 to 11%)</td>
<td>0% (-4 to 3%)</td>
<td>29 Road injuries</td>
<td></td>
</tr>
</tbody>
</table>
Inconvenient truths from neuropathology

Mixed pathology and attenuation of relationship to dementia syndrome at older ages

Figure 1. Modeled and Observed Prevalence of Moderate or Severe Pathological Lesions According to Age. Persons who died with dementia (yellow) are compared with those who died without dementia (blue). Filled symbols represent the observed prevalence of moderate or severe pathological lesions, and I bars show the 95% confidence intervals. The solid and broken lines represent modeled prevalence values.
Lessons learnt

• Sustained commitment over time
• Epidemiological descriptive work and surveillance is critical and is research in its own right
• Population representative platforms allow scrutiny of current fashions
• Right time
• Right place
• Right connections
• Know where your research fits within the firmament, including relevance beyond locality/nation
• Trust – adherence to what the evidence is and doing the best possible research and that others know that is what you do...
For debate

• Public Health research aimed at population benefit is a multidisciplinary, complex and a long term effort
• Sustained and sustainable infrastructure, funding and capacity
• Need surveillance as well as primary research
• Must use approaches that allow local/global relevance
• Role in addressing intractable global problems
• Requires leadership and visibility of its role within society
• Funding should at least match the investment in biomedicine