

Anti-Microbial Resistance:

Behaviour within and beyond the healthcare setting

Report of an ESRC led workshop: January 2015



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This report was written by Professor Ian Donald on behalf of the Economic and Social Research Council (ESRC).

Contents

Summary.....	1
Background to AMR.....	1
Theme 4 – further background.....	2
Research objectives and overarching questions	3
Primary Research and Policy Objectives.....	3
Overarching Questions	4
Research topic priorities.....	4
Awareness and Engagement	4
Public health as an alternative to the use of AMs: Preventing infection and transmission in humans and animals	5
Informal markets and access to AMs.....	6
Stewardship and appropriate use of AMs, in particular antibiotics	7
Reducing barriers and Incentivising the development of new AMs.....	8
Concluding comment.....	9
Annex 1 The international context	10
Annex 2 Workshop attendees	13

SUMMARY

The report is based on the outcome of two workshops that took place in January 2015. The aim of the workshops was to identify the research priorities of the Joint Council initiative on AMR, theme 4: Behaviour within and beyond the healthcare setting. Throughout the workshop it was emphasised that cross-disciplinary research is critical to tackling AMR.

Three primary research and policy objectives were identified:

- Preserving the efficacy of existing antimicrobials (AMs)
- Reducing reliance on AMs
- The development of new AMs.

The objectives apply to the use of AMs in both humans and animals at a UK and global level.

The focus of theme 4 is behaviour. From the workshops five overarching questions underlay much of the discussion:

- What is the behaviour, practices or economic, political, social and cultural structures to be changed?
- What do we already know about that behaviour, practices and structure?
- What are the main factors underlying the behaviour, practices and structure and how can they be modelled and understood?
- What interventions are needed to change behaviour, practices and structures to reduce AMR?
- How can the success of interventions be evaluated and measured?

The topics to emerge from the workshop as priorities were:

- Awareness and engagement
- Public health as an alternative to the use of AMs: Preventing infection and transmission in humans and animals
- Informal markets and access to AMs
- Stewardship and appropriate use of AMs, in particular antibiotics
- Reducing barriers and incentivising the development of new AMs

BACKGROUND TO AMR

Antimicrobial resistance (AMR) is one of the greatest health risks of modern times. More than 50,000 deaths a year can be attributed to AMR in Europe and the USA. It is estimated that within 35 years (2050) 10 million deaths globally will be attributable to AMR. Within that period current

knowledge estimates are that the cost of AMR will have reached \$100 trillion USD, with a reduction in global GDP of between two and two and a half per cent¹.

The UK Government has released a Five Year Antimicrobial Resistance strategy (2013-2018)², which sets out the actions needed to address the problem of AMR. Funders of research into AMR agree that only a multidisciplinary approach will succeed in tackling the rise in AMR and so have formed the Antimicrobial Resistance Funders' Forum (AMRFF). This is chaired by the Medical Research Council (MRC) and includes all the UK Research Councils, Health Departments, Governmental bodies and charities with a direct or indirect interest in AMR and which provide significant R&D budgets in the area. In June 2014, a Cross Research Council initiative³ was launched with the following key themes:

- Theme 1: Understanding resistant bacteria in context of the host
- Theme 2: Accelerating therapeutic and diagnostics development
- Theme 3: Understanding the real world interactions
- **Theme 4: Behaviour within and beyond the healthcare setting.**

THEME 4 – FURTHER BACKGROUND

This report focuses on **Theme 4** of the cross council initiative, and aims to define the research priorities in this area. The Economic and Social Research Council (ESRC) is leading this theme, but other councils and stakeholders have relevance to the theme and research possibilities go beyond the social sciences.

The report is based on the outcome of two workshops held in January 2015. The workshops covered AMR from an International Perspective and AMR within a UK context. The report also draws on the outcome of the ESRC working group on Anti-Microbial Resistance: Setting the social science agenda. Participants in the workshops received or were given access to key publications in AMR research.

Theme 4 aims to elucidate the underpinning drivers of human behaviours relating to AMR, and how behaviour can affect the development and spread of antibacterial resistance. In exploring these issues, the workshop took a broad view of what research might be relevant to understanding behaviour, as well as which behaviours might be relevant to AMR. The theme explored how to best enable effective behaviour change interventions in a variety of settings, relevant to both humans and animals.

¹ Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations. A Review of Antimicrobial Resistance Chaired by Jim O'Neil. December 2014.

http://amr-review.org/sites/default/files/AMR%20Review%20Paper%20-%20Tackling%20a%20crisis%20for%20the%20health%20and%20wealth%20of%20nations_I.pdf

² Five Year Antimicrobial Resistance Strategy 2013 to 2018. Department of Health, September 2013.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/244058/20130902_UK_5_year_AMR_strategy.pdf

³ Further information on the Cross Council Initiative is available on line: <http://www.mrc.ac.uk/research/initiatives/antimicrobial-resistance/tackling-amr-a-cross-council-initiative/>

RESEARCH OBJECTIVES AND OVERARCHING QUESTIONS

The report identifies the research and related policy objectives. The areas of research priority tackle at least one or more of these objectives. A number of disciplines, including those outside of the social sciences, are likely to contribute to achieving the research and policy objectives.

PRIMARY RESEARCH AND POLICY OBJECTIVES

The development of and solutions to AMR is a complex, multifaceted domain. From the workshops and literature three broad areas emerge as objectives for research and policy:

- **Preserving the efficacy of existing AMs** (eg appropriate use of AMs through good stewardship; development of new and effective diagnostic tools)
- **Approaches to reducing the reliance on AMs** (eg through better public health and infection prevention; alternate approaches to animal husbandry).
- **The development of new AMs** (eg encouraging the development of new AMs through incentives; the safe revision of governance structures to facilitate AM development)

These objectives apply to the UK, but to be effective they have to work at a global level. Understanding the differences between international contexts is fundamental to achieving these research and policy objectives. The global nature of the use of AMs and the development of AMR worldwide makes it essential that we understand the processes that underlie the use and misuse of AMs within different local and international contexts. In particular the self-prescribing and use of counterfeit antibiotics needs to be understood. There was a 40 per cent increase worldwide in the known use of antibiotics between 2000 and 2010, of which 75 per cent was in Brazil, Russia, India and China (BRIC) and South Africa⁴. In Low and Middle Income Countries (LMICs) there are issues around access to treatments, alternative health systems and challenges raised by urbanisation and poverty. Moreover, the move to a more meat based nutritional system and the changing relationship people have with animals in these countries requires understanding if AMs are not to be used inappropriately for animals and livestock. There is a need to address these issues on humanitarian and moral grounds. Moreover, the global nature of travel and food supply chains makes AMR a rapidly transportable problem; it is also, therefore, in the UK's direct interest to tackle AMR in other countries.

Each research objective is relevant to both human health and wellbeing and animal health and food production and ensuring food security. Whether or not there are human health implications from

⁴ Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations. A Review of Antimicrobial Resistance Chaired by Jim O'Neil. December 2014.

http://amr-review.org/sites/default/files/AMR%20Review%20Paper%20-%20Tackling%20a%20crisis%20for%20the%20health%20and%20wealth%20of%20nations_I.pdf

zoonotic transmission of AMR, the development of AMR amongst livestock populations threatens food security and economic stability.

Tackling AMR is a multilevel challenge. The focus of theme 4 is behaviour and behaviour change. This is being interpreted broadly to apply to individual, group and community, national and international related issues. The levels do not function in isolation; international policy will translate at a national and community level, and will have consequences for individual understanding and behaviour. It is important to understand the linkages between action and policy at a macro level and the behavioural outcomes of individuals and groups. The need to examine psychological, societal, cultural and structural factors further emphasises the importance of multidisciplinary collaboration.

OVERARCHING QUESTIONS

Although novel research questions are to be encouraged and are likely to emerge, there is a core set of broad questions relevant to each of the topics described in section 4. As well as the focus on behaviours it is also important to consider practices and structures, which can include economic, political, social and cultural, and draw on a range of relevant disciplines and approaches. The overarching questions apply to all of the research topics identified as priorities in section 4.

- What is the behaviour, practices or structures to be changed?
- What do we already know about that behaviour, practices or structures?
- What are the main factors underlying the behaviour, practices or structures and how can they be modelled and understood?
- What interventions are needed to change behaviour, practices and structures to reduce AMR?
- How can the success of interventions be evaluated and measured?

RESEARCH TOPIC PRIORITIES

The workshops and literature generated a large and varied body of research areas relevant to tackling AMR. These have been summarised and structured around five broad topics. Within each of the topics examples of potential, more specific questions have been given. Whilst these provide a guide to questions that researchers may wish to address, they are not an exhaustive set of examples. It is expected that over time some of these questions will be answered and that new questions will emerge.

AWARENESS AND ENGAGEMENT

Awareness of and engagement in the issues surrounding AMR is relatively low in the UK compared to other global issues, such as climate change. Public awareness internationally represents a major challenge. The scale of public awareness across the globe is yet to be established. Because it underlies much motivation and behaviour, there is a need to understand and gauge public and political awareness and engagement in tackling AMR. The relevance of this topic cuts across the research and policy objectives in section 3.1, and each of the research topics and priorities in

section 4. The evolution of AMR is a process requiring on-going, sustained engagement by the public, relevant professionals and politicians.

Questions

- What are the levels of public, professional and political understanding and interest in AMR?
- What are the factors that underlie understanding of AMR and how can that understanding be increased?
- What can be learned from previous public health campaigns – such as the Aids campaign of the early 1980s? What kind of messaging do we need? Is positive messaging to promote appropriate behaviour more effective than restricting behaviour?
- Who are the key groups where increased awareness and engagement are most critical?
- What interventions are most appropriate for which groups? For instance, in addition to the general public, livestock farmers and companion pet owners, parents of preteen children, different faith groups, or GPs.
- What is the potential of social media for engaging different groups?
- Are messages that promote good behaviour more effective than restrictive behaviour? How should messages be presented and represented? How 'stories are told' and how they are absorbed into cultures?
- What are the routes for propagation of beliefs about AMR? What is being offered as alternatives to the myths and misconceptions about AMR and antibiotics?
- How to keep the challenge of AMR on the agenda for decades? What are the forces that facilitate indifference? Who can keep the message alive?
- How can political motivation be sustained globally?
- What is the impact of education? Is education an effective means of changing behaviour?

PUBLIC HEALTH AS AN ALTERNATIVE TO THE USE OF AMS: PREVENTING INFECTION AND TRANSMISSION IN HUMANS AND ANIMALS

The availability of AMs has had the potential to emphasise treatment over the prevention of infection and disease transmission. In both the UK and globally the need for public health, hygiene and biosecurity has, arguably, been eroded. More judicious use of AMs and the development of new ones may assist in maintaining global health. Preventing infection and transmission of disease through public health measures and greater biosecurity in livestock production will improve health and reduce the need for AMs. The role of public health and other control measures needs to be understood in relation to their impact on AM use and AMR development.

Questions

- What is the potential role of public health measures in reducing diseases and infection?
- What are the potential costs and benefits of improved public health and how does that compare to the long-term use of AMs? What can we learn from history and other contexts about these costs and benefits?
- What are the factors that contribute to AMR other than consumption eg design of systems and specific aspects of settings, overcrowding, urbanisation, and sanitation?

- What is the relationship between the community and public health systems and professionals?
- What alternative ways of managing disease are there?
- Can improved husbandry of livestock reduce infection significantly? Are there acceptable methods for farmers? What is the economic viability of other methods of dealing with infection without using AMs? What is the relationship between AMs and biosecurity?
- What is the impact of urbanisation and poverty on AMR and the availability and use of AMs and means of inhibiting infection? What are the additional challenges in LMICs? What can be learnt from historic disease control in the UK, Europe, and beyond that can be translated effectively to other contexts?
- Are public health professionals the most appropriate people to deliver public health messages and practices in LMICs?
- Is effective prevention rather than cure viable? What are the behavioural, cultural and structural barriers to improved hygiene?
- How do farming practices impact on disease and infection? What are the alternative methods of controlling infection and disease amongst livestock?
- Do we have information about public health implications of transmigration?
- Would more holistic views of health and the use of AMs be possible in all contexts?
- What are the impacts of health inequalities on public health, access to AMs and the development of and exposure to AMR?
- What is the strength of healthcare systems in different countries? What are the implications to those systems of AMR and the implications of reducing the use of cheap AMs? What is the potential role of public health measures in reducing diseases and infection?
- What is the impact of slums, poverty and urbanisation on AMR?

INFORMAL MARKETS AND ACCESS TO AMs

The wide availability of drugs and treatments internationally, particularly antibiotics, raises issues of stewardship, monitoring and control. Within LMICs where lack of access to adequate treatment, including antibiotics, has been a major issue and the focus of public health strategies for many years, growing availability through informal markets can be seen as positive. However, the non-prescription availability of antibiotics and the use of counterfeit, often substandard, products is a significant challenge to slowing the development of AMR. The accessibility of AMs and in particular antibiotics via the Internet is increasing unregulated access and has raised concern about accessibility in the UK. In addition to informal healthcare markets, antibiotics are accessible to farmers, livestock producers, racehorse owners and pet owners. The informal markets for AMs have grown out of particular contexts, cultures and traditions around the world. Understanding the drivers within those environments as well as in the UK will be beneficial in tackling AMR.

Questions

- Rationing markets: What are the consequences of controlling supply and rationing markets both in the UK and globally? Will there be unintended consequences? Will it lead to pressure on the developments of secondary markets?

- Can the impact of economic and governance policy and structures be identified and modelled?
- The nature and functioning of informal health care systems need to be described and understood. What are the functions of formal and informal healthcare systems? What are their interrelationships?
- The Digital economy leads to more informal systems across the globe. Can it be regulated? What alternatives are there? Can it be modelled? What are the implications for modelling AMR? What is the impact of the internet on availability and use of AMs for both systems? How is information available from the internet used to make decisions? Can that information be enhanced?
- There are raising expectations of health and access to drugs in LMICs where populations have witnessed the success and benefits of AMs for improving health. What is the relationship of expectation to informal markets?
- How could formal healthcare systems draw on local, informal practices to make it feasible? Is it possible to provide universal access to appropriately regulated therapies?
- What is the supply chain for AM? Can the supply chain be mapped? What are the global and local incentives for supply and demand?

STEWARDSHIP AND APPROPRIATE USE OF AMS, IN PARTICULAR ANTIBIOTICS

One of the largest challenges facing AMR policy, intervention and research is the stewardship and appropriate use of existing AMs, in particular antibiotics. In human health a key issue is the unnecessary, inappropriate and incorrect prescribing of antibiotics. A related concern has been the impact of the failure of people to complete courses of antibiotics, although there is a lack of clarity around the real importance of this for the development of AMR. Research has and is being conducted by a range of stakeholders in the area of stewardship and use. It is important to monitor and track the findings and emerging research questions. Where appropriate, research results from different studies need to be synthesised. The issue of inappropriate, incorrect and unnecessary use of antibiotics is also present in relation to both human and animal health. The widespread use of antibiotics in livestock production adds a further set of challenges. The position in relation to veterinary use of antibiotics is much less clear than it is for human consumption. There have been a small number of studies in particular livestock sectors. There needs to be a much more thorough review of what is known about the use of antibiotics in animals, including its relationship with human health, and further research contributing to our understanding of the current position.

Questions

- What are the factors and drivers putting pressure on inappropriate prescribing in primary care? Are there lessons to be learned from hospital prescribing and closer monitoring?
- What is GP/vet knowledge and practice policy on antibiotic use and AMR? Have initiatives to date had an impact on practice?
- What are the wider drivers for prescribing? For example, how do public perceptions, knowledge and beliefs affect prescribing? What methods of more accurate diagnosis are needed and what form would prove acceptable?

- What are the drivers for veterinary practices? What influence does the current business model of vets prescribing and supplying AMs have on prescribing levels? What do farmers understand of AMR and what are the beliefs surrounding the use of antibiotics? How do business models affect the use of AMs in livestock production? What are the differences in the use of AMs across different livestock sectors?
- How does AMR fit into the curriculum in medical and veterinary schools? What is the level of knowledge and understanding of qualifying doctors and vets? How does that knowledge and understanding change once in practice? What factors influence that change? Can newly qualified doctors and vets be used as a catalyst for change amongst established practitioners?
- What are the issues in the use of existing diagnostics and in the development of new diagnostic tools? There is a need to identify where and which type of diagnostic tools will be most effective. What is the likely public response to new tools? What will be the impact of expectations and trust in the UK and internationally?
- AMs have allowed Low and Middle Income Countries to treat life-threatening disease cheaply and effectively. What are the ethics of reducing AM use? What are the justice and equality issues compared to the richer nations?
- How can we design global programmes that combine the promotion of (appropriate) use of antibiotics alongside efforts to control this use?
- What are the most effective locally-appropriate practices to communicate with different communities? For example is there a role for storytelling, performance, soap opera? Should communities develop their own message?

REDUCING BARRIERS AND INCENTIVISING THE DEVELOPMENT OF NEW AMS

The lack of new AMs coming to market and the lack of R&D efforts by pharmaceutical companies has been highlighted in numerous reports and is widely recognised. Critical to the development of new AMs are the incentives to pharmaceutical companies to undertake development work. With increased efforts to reduce the use of AMs, the existing structures and business models are likely to reduce incentives rather than increase development in the future.

Questions

- Are there new business models that may incentivise drug development?
- What is the role and effect of regulation and governance? How can the development of AMs be facilitated whilst preserving patient safety?
- What is the relationship between trade and other international agreements and their effect on antimicrobial response?
- What are the barriers to the development of new AMs in international markets?
- What, if any, incentives systems have worked in the past in other areas and contexts?
- What are the implications of new business models, regulation and governance, pricing structures for LMICs? Will the pricing structure exclude use amongst some communities and foster the development of counterfeit AMs?

CONCLUDING COMMENT

“The mechanisms which lead to antimicrobial resistance are biological. However the conditions promoting, or militating against, these biological mechanisms are profoundly social. How our farmers, vets, and regulatory systems manage livestock production for human consumption; how regulatory and fiscal frameworks incentivise or deter antimicrobial development, production and use; how the public and healthcare professionals understand, value and use antimicrobials; the context in which animals and humans interact; the ways in which particular groups of humans are exposed to particular microbial infections; all these are shaped by social, cultural, political and economic forces. Social science therefore has a key role to play in measuring, modelling, understanding, and where appropriate changing the social environment in relation to antimicrobial resistance.” Professor Dame Sally Macintyre (ESRC Working Group Chair)⁵

⁵ Anti-Microbial Resistance: Setting the Social Science Agenda. Report of an ESRC Working Group: July 2014: http://www.esrc.ac.uk/_images/AMR-Setting-the-Social-Science-Agenda-report_tcm8-31249.pdf

ANNEX 1 THE INTERNATIONAL CONTEXT

The following text summarises some of the key issues relevant to international settings. The issues have been identified and included in the main body of the text. For ease of reference, they are presented here within a single annex.

It is clear that AMR is a global challenge. The importance of research on AMR in a variety of different international settings was identified during a workshop to discuss the broad topic of AMR and behaviour in London in January 2015. In particular, the readily available supply of non-prescription and counterfeit antibiotics, and the functioning of informal health care systems were noted and identified as challenges. There are also a number of issues and questions that thinking about AMR globally brings to the fore. For instance, a challenge to practical initiatives to tackle AMR internationally is how activity will be coordinated. Which international bodies will be responsible and accountable? There is a historic context that needs to be considered and understood which is likely to raise issues of trust, vested interests and leadership, which may impact the effectiveness of international efforts. There are sets of research questions that should be considered in that context, some of which are identified in this annex.

Cross cutting questions

- How should global collective action be coordinated and by whom?
- Do developing and developed countries have different interests that will influence the effectiveness of measures to tackle AMR?
- What is the gap between guidelines (eg WHO) and implementation within countries? Why does the gap exist and how can it be closed? Who are the implementers in each country? Are they national policymakers or more local officers eg district health officers, or informal markets and shops, distributors, boarder agencies, mobile phone companies? Is there some way to bring them together? How are decisions made locally, by whom, and can they be engaged?
- Are there vested interests and how can they be taken into account? Is there a potential trusted broker that can promote appropriate action to slow the development of AMR?
- How does the global trade and the global movement of people and refugees impact on AMR?

Awareness and Engagement

Awareness of and engagement in the issues surrounding AMR is relatively low in the UK compared to other global issues, such as climate change. Public awareness internationally represents a major challenge. In many locations, use of drugs is actively promoted by those aiming to improve health, and/or desired by individuals and groups who previously didn't have access. In this context, messages around restraint in use need to be carefully constructed. It is important that research takes into account issues of equity and fairness, especially in Low and Middle Income Countries.

- What are the levels of public, professional and political understanding and interest in AMR?

- AMs have allowed Low and Middle Income Countries to treat life-threatening disease cheaply and effectively. What are the ethics of reducing AM use? What are the justice and equality issues compared to the richer nations?
- How can we design global programmes that combine the promotion of (appropriate) use of antibiotics alongside efforts to control this use?
- What are the most effective locally-appropriate practices to communicate with different communities? For example is there a role for storytelling, performance, soap opera? Should communities develop their own message?

Public health as an alternative to the use of AMs: Preventing infection and transmission in humans and animals

The availability of AMs has led the potential to emphasise treatment over prevention of infection and disease transmission. In both the UK and globally the need for public health, hygiene and biosecurity has, arguably, been eroded. More judicious use of AMs and the development of new ones may assist in maintaining global health. Preventing infection and transmission of disease through public health measures and greater biosecurity in livestock production will improve health and reduce the need for AMs. The role of public health and other control measures needs to be understood in relation to their impact on AM use and AMR development.

- What is the strength of healthcare systems in different countries? What are the implications to those systems of AMR and the implications of reducing the use of cheap AMs? What is the potential role of public health measures in reducing diseases and infection?
- What is the impact of slums, poverty and urbanisation on AMR?
- What is the outcome of inequalities in terms of both resources and exposure? Before availability AMs there was greater inequality in health. Will the restriction of AMs and the rise of AMR mean a return to greater health inequalities?
- Are public health professionals the most appropriate people to deliver public health messages and practices?

Informal markets and access to AMs

The non-prescription availability of antibiotics and the use of counterfeit, often substandard, products is a significant challenge to slowing the development of AMR. In addition to informal healthcare markets, antibiotics are accessible to farmers, livestock producers, racehorse owners and pet owners. The informal markets for AMs have grown out of particular contexts, cultures and traditions around the world. Understanding the drivers within those environments as well as in the UK will be beneficial in tackling AMR.

- Rationing markets: What are the consequences of controlling supply and rationing markets both in the UK and globally? Will there be unintended consequences? Will it lead to pressure on the developments of secondary markets?
- There are raising expectations of health and access to drugs in LMICs where populations have witnessed the success and benefits of AMs for improving health. What is the relationship of expectation to informal markets?

- The nature and functioning of informal health care systems need to be described and understood. Can it be regulated? What alternatives are there? Can it be modelled? What are the implications for modelling AMR?
- The Digital economy leads to more informal systems across the globe. How is information available from the Internet used to make decisions? Can that information be enhanced?
- What are the functions of formal and informal healthcare system? What are their interrelationships? How can 'formal' systems draw on local, informal practices to make it feasible? Is it possible to provide universal access to appropriately regulated therapies?
- What is the supply chain for AMs? Can the supply chain be mapped? What are the global and local incentives for supply and demand?

Stewardship and appropriate use of AMs, in particular antibiotics

One of the largest challenges facing AMR policy, intervention and research is the stewardship and appropriate use of existing AMs, in particular antibiotics. The issue of inappropriate, incorrect and unnecessary use of antibiotics is also present in relation to both human and animal health.

- What knowledge do various actors in the 'supply chain' for AMs have about their use? Have initiatives to date had an impact on practice? Can we apply learning from other health related situations to AMR?
- How does public understanding drive the use of AMs? How is the understanding evolving/influenced?
- What methods of more accurate diagnosis are needed and would be practically feasible in different country contexts?
- What are the drivers that relate to use of AMs in animal husbandry (farmers, vets etc)?

Reducing barriers and Incentivising the development of new AMs

The lack of new AMs coming to market and the lack of R&D efforts by pharmaceutical companies has been highlighted in numerous reports and is widely recognised. Understanding how to incentivise new drug development in the global market place is an important area for new research.

- What is the role and effect of regulation and governance globally?
- What is the relationship between trade and other international agreements and their effect on antimicrobial response?
- What are the barriers to the development of new AMs in international markets?
- What are the implications of new business models, regulation and governance, pricing structures for different countries? Will the pricing structure exclude use amongst some communities and foster the development of counterfeit AMs?

ANNEX 2 WORKSHOP ATTENDEES

Professor Roger Jeffery	University of Edinburgh
Dr Gerald Bloom	Institute of Development Studies
Professor Stefan Elbe	University of Sussex
Professor Abdul Ghaffar	WHO
Sarah Rappaport	Wellcome Trust
Elizabeth Pisani	Ternyata
Professor Maureen Mackintosh	Open University
Dr Simon Rushton	Sheffield University
Professor Hilary Standing	Institute of Development Studies
Dr Anne Roemer-Mahler	University of Sussex
Dr Gina Pinchbeck	University of Liverpool
Dr Caryl Williams	DEFRA
Professor David Armstrong	KCL
Professor Steve Hinchliffe	University of Exeter
Dr Christie Cabral	University of Bristol
Dr Lou Atkins	UCL
Dr Caroline Wood	UCL
Professor Cormac O'Grada	University College Dublin
Ursula Wells	Department of Health
Phil Taverner	NIHR
Claire Kidgell	NIHR
Anna Sallis	PHE
Tim Chadborn	PHE
Elizabeth Marier	DEFRA
Professor Joanna Coast	University of Birmingham
Dr Dan Lockton	Royal College of Art
Diane Ashiru-Oredope	PHE
Professor Richard Smith	LSHTM
Professor Ian Donald (consultant)	University of Liverpool
Professor Joyce Tait	University of Edinburgh
Professor Sally Macintyre	University of Glasgow
Professor Tony McEney	University of Lancaster (CASS)
Dr Mathew White	University of Exeter
Professor Alastair Macdonald	Glasgow School of Art



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