**‘LMICs as reservoirs of AMR’: a comparative analysis of policy discourse on antimicrobial resistance** **with reference to Pakistan**

**ABSTRACT**

Antimicrobial resistance (AMR) has recently emerged as a salient global issue, and policy formulation to address AMR has become a contested space, with various actors sharing competing –and sometimes contradictory- explanations of the problem and the range of possible solutions. To facilitate national policy setting and implementation around AMR more needs to be done to effectively engage policymakers in low- and middle-income countries (LMICs). However there is a dearth of research on differences in issue framing by external agencies and LMIC’s national policymakers on the problem of AMR; such analyses are imperative to identify areas of conflict and/or potential convergence. We compared representations of AMR across nine policy documents produced by multilateral agencies, donor countries and an LMIC at the forefront of the global response to AMR – Pakistan. We analysed the texts in relation to five narratives that have been commonly used to frame health issues as requiring action: economic impact, stunting of human development, consequences for health equity, health security threats and relationship with food production. We found that AMR was most frequently framed as a threat to human health security and economic progress, with several US, UK and international documents depicting LMICs as ”hotspots” for AMR. Human development and equity dimensions of the problem were less frequently discussed as reasons to address the growing burden of AMR. It is clear that no single coherent narrative on AMR has emerged, with notable differences in framing in Pakistani and external agency led documents, as well as across stakeholders primarily working on human versus animal health. While framing AMR as a threat to economic growth and human security has achieved high-level political attention and catalysed action from governments in high-income countries, our analysis suggests that conflicting narratives relevant to policymakers in Pakistan may affect policy-making and impede the development and implementation of integrated initiatives needed to tackle AMR.

**INTRODUCTION**

Antimicrobial resistance (AMR) has always existed as a natural evolutionary process. However, accelerated emergence of acquired AMR due to over and misuse of antibiotics has in recent years been positioned as a global ‘threat’ that needs urgent action, receiving unprecedented political and financial attention (O’Neill 2016; World Bank 2017). Substantial funding – estimated at $40bn over the next 10 years – is being sought to address AMR (O’Neill 2016). Combatting AMR is now a central component of the Global Health Security Agenda and the International Health Regulations (IHR) (World Bank 2017). These linked platforms aim to minimise global health threats posed by infectious diseases focusing political attention and encouraging participation, coordination, and collaboration across multiple stakeholders, including those working on animal health, human health and the environment (World Bank 2017), (World Health Organization 2016a). AMR has also been addressed at the highest level political fora, becoming one of only a few health issues discussed in a special session by the United Nations General Assembly (UNGA) in September 2016 (World Health Organization 2016a). A key challenge to addressing AMR discussed at the UNGA meeting is the multitude of actors that need to be engaged. These include national governments, non-governmental organizations, civil society, the private sector and academic institutions, as well as experts from human and veterinary medicine, agriculture, finance and the environment sector.

Despite AMR’s emergence as a salient global issue, the complexity and uncertainty of its underlying drivers – for example, lack of enforcement of regulations, gaps in veterinary and medical education, and lack of primary healthcare coverage – and the variety of actors that need to be involved at global, national and sub-national levels, make it a very challenging issue to tackle (Khan et al 2018b).

As noted by Hutchinson (2017): “there is no single, logical pathway through which policy prescriptions and governance mechanisms can be created to act upon AMR”. Instead, like many other global health issues, policy formulation to address AMR has become a contested space, with various actors sharing competing ideas about the problem and range of possible solutions (Wernli et al 2017). Thus far, national policy setting and implementation around AMR has been limited in low- and middle-income countries (LMICs) and more needs to be done to effectively engage LMIC policymakers (Carlet et al 2014; World Health Organization 2018b), as differences in stakeholder perceptions about AMR are critical in making the case for action. The main objective of our study was to examine how one LMIC government is positioning AMR in national policy documents, and to contrast this framing with that used in international policy documents.

***Framing and the AMR policy process in LMICs***

We employ an approach to policy analysis that draws on a constructivist epistemology, focusing on the tacit role that values, beliefs and feelings play in influencing meaning imparted to social action (Yanow 1996). Constructivist theories propose that in the social world, our own perceptions shape our understanding of the world, and that participants will often have competing perspectives about the origins, importance and unfolding of phenomena (McInnes and Roemer-Mahler 2014; Yanow 1996). Framing involves making some aspects of a perceived reality more salient so as to suggest a particular definition of the policy ‘problem’, an explanation of its causes, and a proposed resolution (Entman 1993, cited by McCombs 2005). Framing thus not only reflects an understanding of the problem (cognitive dimension) but also underlying values about what ought to be done (normative dimension). In this context, policymakers often explicitly or implicitly mobilise frames in order to shape other actors’ perceptions of the legitimacy and appropriateness of their suggested policy response, often with a view to gaining influence or policy purchase (McInnes et al 2012; McInnes and Roemer-Mahler 2014). Framing analysis has therefore become increasingly important in the field of health policy analysis, shedding light on the nature of policy debates and helping researchers to understand responses to opaque and ‘wicked’ policy problems (Koon et al 2016), such as tobacco control, alcohol, obesity, and health financing (Fogarty and Chapman 2012; Gollust et al 2013; Smith 2013; Tynkkynen et al 2012).

Despite a growing body of framing research in the health policy literature, there has been a paucity of framing analyses that focus on health policy processes in LMIC contexts (Gilson and Raphaely 2008). This is particularly problematic in the case of AMR. Global public goods such as antimicrobials (AMs) can only be preserved if all countries cooperate, and therefore strong commitment from national policymakers around the world is essential (Rochford et al 2018). A rise in political attention to AMR in high-income countries (HICs) and actions in this subset of countries alone will not be sufficient; action from LMICs to tackle drivers of AMR is essential due to the global nature of AMR, including potential spread through global trade and travel. Here framing of AMR and responses to it may be a critical element of political strategy, as effective framing has been shown to influence perceptions of how an issue affects interests of powerful stakeholders (Finnemore and Sikkink 1998). Reports on the urgent need for action on AMR commissioned by HICs, and guidelines produced by multilateral agencies (Food and Agriculture Organization of the United Nations 2016; World Organisation for Animal Health 2016; World Health Organization 2015), may thus try to frame issues in a way that resonate with domestic stakeholders and intended audiences in LMICs. Of course, those that receive frames also apply their own beliefs and values to them. As such, in the context of AMR and the policy process in LMICs, framing is a process through which stakeholders who produce and receive frames make sense of them by interpretation through other socioeconomic, psychological and cultural concepts, and values (Fischer 2003) and by taking into consideration potential vested interests.

To date little attention has been given to differences in framing used by multilateral (WHO, FAO and others), bilateral (e.g. US, UK) and LMIC national policymakers on the problem of AMR; such analyses are imperative to identify areas of competition or potential convergence (McInnes and Roemer-Mahler 2014). Wernli et al (2017) have identified five main frames used by global health actors to represent AMR: ‘AMR as healthcare’, ‘AMR as development’, ‘AMR as innovation’, ‘AMR as security’ and ‘AMR as One Health’. In this paper, we extend this initial study to analyse and compare AMR framing used in a variety of policy documents produced by multilateral agencies, donor countries and one low income country at the forefront of the global response to AMR – Pakistan. Using Pakistan as a case study, we compare how national and international stakeholders frame AMR as a policy problem requiring action. We anticipate that this will shed light on how to more effectively engage policymakers in LMICs to tackle AMR at national level. Through this case study our analysis also seeks to contribute to the wider literature on framing within health policy processes in LMIC contexts, specifically investigating framing of an issue in multiple ways by diverse stakeholders (McInnes and Roemer-Mahler 2014).

***Pakistan as a case-study***

As the world’s sixth most populous nation, Pakistan serves as a relevant case study of the AMR policy process for a number of reasons. These include its unique position at the forefront of the response to AMR, the challenge of numerous issues competing for limited funding for health and the tense historical context of external agency involvement in health and security in the country (Lenzer 2011; Nishtar et al 2013).

Pakistan was one of the first countries to volunteer to undergo the Joint External Evaluation (JEE) process to assess – in collaboration with external parties – its capacity to address public health threats, including AMR. In recognition of its advanced status in terms of cooperation with agencies involved in global health security, the country’s Health Minister was invited to speak about the JEE process at the World Health Assembly in May 2016. At this meeting, the AMR situation in Pakistan was discussed on a global platform (Government of Pakistan 2016a); while there were strengths in other elements of the JEE, Pakistan had the lowest possible score on capacity to deal with AMR issues (WHO 2016b). This is in line with studies indicating that there is extremely high use of specific AMs, growing levels of AMR, poor knowledge about AMs among the public and healthcare providers, and limited regulation and stewardship surrounding the issue of AMR (Government of Pakistan 2017). With international attention and pressure on Pakistan, a National Action Plan (NAP) to address AMR has recently been developed (Government of Pakistan 2017) in collaboration with international agencies such as the US Centers for Disease Control and Prevention (CDC).

Despite traction on developing an AMR policy document, the health sector is given low priority and is hugely underfunded in Pakistan, with approximately only 0.6% of GDP allocated to health by the government, one of the lowest allocations in the world (Government of Pakistan 2016b). As public sector healthcare provision is insufficient to meet demand, only a fifth of the population uses the public sector and patients often visit private doctors and clinics, resulting in out-of-pocket expenditure of approximately 56% (Zaidi et al 2013; Zaidi et al 2017). Other systemic challenges include large influence of external donors on health policy setting resulting in low ownership by domestic actors, weak institutional governance, high population growth and a lack of properly trained human health professionals (Haq et al 2017; Khan et al 2018a; Nishtar et al 2013). The relatively small resource allocation to health is stretched across numerous issues – including regular natural disasters and polio outbreaks – which means that AMR competes for policymaker attention (Nishtar et al 2013).

AMR is importance major public health issue in Pakistan, the world’s sixth largest country, i.e. it genuinely affects a large number of people there. Investigation of issues related to AMR in Pakistan also provides insight into some of the challenges faced by other LMICs, with similar characteristics, such as a large number of informal health providers, comparatively weak regulatory capacity and with a large proportion of the population living in poverty. Framing research is an important tool to investigate these issues; it is imperative that we know whether frames used in international documents are those that resonate at country level in national policy documents so we can begin to address issues such as AMR.

**METHODS**

Our study was conducted between September 2017 and September 2018. To select and analyse the content of the policy documents we followed three steps. The first step involved defining what we meant by a policy document and devising criteria to identify relevant policy reports. We defined policy documents as formal reports written by national governments or international organisations detailing decisions, plans, and actions that were undertaken to achieve specific health care goals within a society (World Health Organization 2018a), with a focus on reports examining AMR. To meet the inclusion criteria, policy documents had to address directly at least one aspect of national responses to tackle AMR. Documents were selected for inclusion in the study following a desk review to identify Pakistani documents that addressed AMR, and the most relevant international documents from the UK and USA, two of the biggest donors to Pakistan and champions globally of the response to AMR. In addition, we selected two international documents that focus on One Health issues around AMR, and the WHO GAP as this is the main policy document on which all country-specific national action plans are based. To validate document choice we convened a study advisory body of 12 people from the UK and Pakistan to advise on document selection and overall study design.

We identified the following Pakistan specific policy documents: National Strategic Framework for Containment of Antimicrobial Resistance (AMR) (Government of Pakistan 2016c; NSF); Antimicrobial Resistance National Action Plan (2017; NAP) and Pakistan Joint External Evaluation (2016; JEE). Global documents considered potentially important in influencing the design of the AMR policy in LMIC were: UK Five Year Antimicrobial Resistance Strategy 2013 to 2018 (2013; UK Strategy); US National Action Plan for Combating Antibiotic-Resistant Bacteria (2015; US NAP); Global Action Plan on Antimicrobial Resistance (2015; WHO GAP); Tackling Drug-Resistant Infections Globally: Final Report and Recommendations (2016; O’Neill); The OIE (World Organisation for Animal Health) Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials (2016; OIE); and The FAO Action Plan on Antimicrobial Resistance 2016-2020 (2016; FAO). A description of the documents analysed is provided in Table 1.

Once we had identified the key policy documents we proceeded with the second step, which consisted of deciding on the data to be extracted from each of the reports. We designed a proforma including the following information: name of the policy; purpose of the policy; author of the report; stakeholders involved in the process; and stakeholders identified as critical to the response. We also recorded details of who commissioned and funded the documents. Data were extracted by ADB and verified against the source document by MSK.

The third step consisted of developing an approach to analyse the content of the reports. In line with the study objectives, we sought to determine the frames used to define the problem of AMR and to depict why there is a need for urgent action. After an initial round of deductive coding by three authors (ADB, MSK, JH) the full author team had discussions to build consensus on the list of themes for line by line deductive coding taking into account the frames used by Wernli and colleagues (Wernli et al 2017), which was published during our first round of coding. As we analysed the documents more systematically, we also noted down any new codes that we identified. The study team included Pakistani and European researchers who were trained in different disciplines, including anthropology, sociology, epidemiology and microbiology. The team also varied in terms of the geographical focus of their work, with some being new to the Pakistani context and others having worked there for decades.

As summarised in Table 2, we identified and defined five frames that have consistently been found in other analyses to present a health issue needing action: economic impact, stunting of human development, consequences for health equity, health security threats and relationship with food production (Labonte and Gagnon 2010; Stuckler and McKee 2008; Kamradt-Scott and McInnes 2012; Wernli et al 2017).

**RESULTS**

***AMR as an economic problem***

With the exception of the OIE report, all of the policy documents depicted AMR as an economic problem, defining it in terms of financial costs incurred by individuals and health systems in Pakistan and abroad, as well as in terms of wider economic impact due to business losses, particularly in agricultural production and trade. The implicit, and often explicit, motivation for action was therefore the future economic costs to individuals and health systems due to the spread of AMR.

The extent to which this frame was promoted varied across documents ranging from the very focused and deliberate articulation of AMR as an economic threat (O’Neill) to discursive acknowledgements of the economic risks posed in order to narrate the severity of the problem (e.g. JEE/US NAP/FAO). In general, the economic frame tended to be more heavily integrated into international documents, particularly those from the UK and the US, whereas Pakistani documents mobilised this frame less frequently. The O’Neill report framed AMR in terms of economic impact more strongly than any of the other documents, making a clear economic case for action:

*‘The reality is that governments will sooner or later bear the cost of AMR: they can either do so proactively by taking action now and pay less for better outcomes, or remain unprepared and end up spending much more taxpayer money on far worse outcomes further down the line’.*

Pakistani policy documents tended to focus on the ‘significant economic burden’ posed by AMR in Pakistan, while also commenting on the extent of this economic risk at the global level. For example, the NSF depicted the problem in terms of its future economic costs as a result of healthcare spending and loss to productivity: “Attributable healthcare costs and productivity losses are estimated to be at least €1.5 billion each year”. Although some focus was placed on the cost to individuals, who were referred to as ‘consumers’ (NSF), and to health systems, focus was largely on costs incurred through losses in trade, agricultural production, and business. In this context, the globalised nature of the threat was highlighted. For example, the NAP argued that collective action amongst other states such as Bangladesh, Nepal, and Sri Lanka was required to limit AM use due to the “…interconnectedness of the pharmaceutical commerce and trade industries”.

The UK Strategy, in contrast to the NSF, emphasised the unpredictability of the economic threat but also the certainty that costs will be high:

*‘There is much that is not known and more evidence will be required before the full extent of the economic and social burden of AMR can be determined ... it is clear from the economic analysis that resistance has the potential to have a major impact’.*

Similarly, all international documents stated that more data are needed before definite conclusions about economic impact can be drawn.

Rather than communicating economic uncertainty, the WHO GAP document focused on concrete examples of economic losses to narrate this risk:

*“Antimicrobial resistance is a drain on the global economy with economic losses due to reduced productivity caused by sickness (of both human beings and animals) and higher costs of treatment”* (WHO GAP).

Like the O’Neill report, the reason for action was premised on the notion that we need action and investment now to thwart higher costs later. The UK Strategy’s framing of AMR as an economic threat appears to be a deliberate tactic to garner sustained support in the longer term: ‘[AMR] needs to be seen as the economic and security threat that it is’. Finally, the loss of value of medicines was commented on in the WHO GAP: ‘For the pharmaceutical sector, medicines that are no longer effective lose their value’.

***AMR as a human development issue***

AMR is also depicted as a problem affecting health and quality of life across the documents, although less commonly than the economic framing. In some documents (NSF, O’Neill, UK Strategy) the human development narrative focuses on the health impact of AMR in the context of infectious diseases broadly, contrasting HICs with LMICs where previously curable illnesses are now threatening population health and development. The WHO report emphasises that ‘some of the commonest childhood diseases in developing countries… can no longer be cured with many older antibiotics or medicines’ (WHO GAP).

Other documents directly position AMR as an impediment to human development, highlighting the potential consequences of spreading resistance:

*‘The indirect impact of antimicrobial resistance, however, extends beyond increased health risks and has many public health consequences with wide implications, for instance on development’* (WHO GAP).

The O’Neill report goes further to suggest that AMR will become a major barrier to human development in LMICs since they will face ‘most of the direct and much of the indirect impact of AMR’. A different framing of underlying causes of differences in human development between HIC and LMICs is presented in the NSF, where some responsibility is shifted to failings in ‘global governance, research prioritization and the market system at the global level.’ The WHO GAP also emphasised the role of the pharmaceutical industry and disparities in spending power between industry and LMIC governments in preventing countries from combatting AMR:

*‘In some cases, industry spending on promoting products is greater than governmental investment in promoting rational use of antimicrobial medicines or providing objective information’.*

Human development is also framed in the context of protecting the health of Pakistani citizens and that the government is taking action: ‘it [the document] reflects the vision of the government for the protection of health of the people of Pakistan’ (NSF). In addition, the government ‘has recognised AMR as a major threat to the health and development of its population’ (JEE).

The FAO document emphasised the link between preserving AMs in agriculture and health, productivity and livelihoods of individuals:

*‘The availability and use of antimicrobial drugs in terrestrial and aquatic animals and in crop production is essential to both health and productivity. It contributes to food security, food safety and animal welfare, and in turn, to the protection of livelihoods and the sustainability of animal and crop production.’*

Overall, with the exception of the FAO, where documents highlight the potential burden or costs of AMR to human development, this is done with limited linkages to animal and environmental health.

***AMR as a health equity issue***

Overall references to health equity across policy documents varied, highlighting an as yet limited narrative on equity and AMR. The WHO GAP and Pakistani policy documents (NAP, NSF) also framed AMR as a health equity issue. According to this narrative, action is mobilised from a normative, moral standpoint, where combatting AMR is positioned as critical to ensuring that the right to health of individuals in Pakistan, and other LMICs, is protected, including appropriate access to safe AMs. While framing in terms of economic burden discussed the impact that will occur in the future, the NSF highlights that there is already a geographic difference in the impact of AMR: ‘Antibiotic resistance has risen alarmingly and emerged as a major health threat in the developed world but more so in resource poor countries including Asia.’

Discussion of equity was detached from a broader interrogation of structural or ‘upstream’ determinants of health inequalities and instead focused further downstream on inequitable access to basic healthcare, new tools, and safe medicines. For instance, representing AMR as an issue about access to safe medicines rather than interrogating the health system weaknesses behind it: ‘effective and safe medicines [are] accessible to all who need them’ (NSF). The JEE also appeared to place more emphasis on developing new tools rather than addressing root causes: ‘The evolution [of] AMR is occurring at an alarming rate and is outpacing the development of new countermeasures capable of thwarting infections in humans.’

A particularly strong emphasis was placed on the health equity and justice frame in the WHO GAP document in the context of research and development/innovation, where it was stressed that new products and medicines need to be developed while ensuring availability and accessibility to populations living in LMICs. The WHO GAP discussed how ‘affordable and equitable access’ to new medicines and technologies can be ensured for the ‘poorest populations’, through public-private partnerships and ‘fair pricing and donations’ but without substantial emphasis on addressing the underlying market dynamics driving these issues. It did, however, mention ‘fair pricing and donations for the poorest populations’, alluding to the role of industry.

The O’Neill report presented the case that access needs to be ensured for vulnerable populations while tackling excess use overall: ‘access to drugs that patients actually need should not be reduced’ and ‘for many the lack of drugs for treatable infections will pose a more direct threat to their health than drug resistance’ (O’Neill).

***AMR as a health security issue***

Our analysis indicated two different slants on framing of the health security risk posed by AMR: AMR as a threat across international boundaries (external) and AMR as a threat to systems and populations in Pakistan (internal).

Security was a particularly prominent frame used in the Pakistani documents and JEE. The two Pakistani documents (NSF, NAP) frame AMR as an external and internal health security issue, linking the situation in Pakistan with similar situations in the rest of the world, and inferring that Pakistan is taking action as a responsible global citizen: ‘The Government of Pakistan shall remain committed to the WHO resolutions on AMR as a responsible member state to comply with the global health security challenges’ (NSF). The JEE also focuses on what Pakistan must do to protect the health of its own citizens (for example, improving vaccination coverage, food safety standards and waste disposal), and to prevent cross-border spread of disease.

The UK and US documents frame the issue as one in which HICs (i.e., the UK and US) are in danger of disease crossing borders, but are prepared to help other countries defend themselves, and they position themselves as leaders who can prevent AMR from becoming an even bigger global threat:

*‘..real threat to our future health and prosperity, the government is working internationally to promote the importance of containing AMR’* (UK Strategy).

*‘The United States will work domestically and internationally to prevent, detect, and control illness and death related to infections caused by antibiotic-resistant bacteria’* (US NAP).

The US document also emphasizes the need for collective action to address AMR, and details specific measurable targets and strategies for improved coordination and collaboration. As a worldwide organisation, the WHO GAP frames health security as a global issue and, similarly to the US NAP, discusses it in the context of collaboration between countries. The O’Neill report uses a similar framing around supporting LMICs in order to protect HICs, keeping with its wider framing in terms of economic consequences. An implicit framing of ‘us’ (HIC – at risk) and ‘them’ (LMICs – source of the risk) is present, with ‘imported infections’ being mentioned in the UK Strategy: ‘Even if out of pure self-interest, it may make sense for high‑income countries to support these efforts in lower income settings’ (O’Neill).

The FAO and OIE documents frame health security risks in terms of AMR in both humans and animals, reiterating the need for collaboration owing to ‘the shared global threat of AMR in animals and humans’ (OIE). In keeping with framing in other global policy documents, there is an underlying message that the threat comes from LMICs:

*‘The risk appears particularly high in countries where legislation, regulatory surveillance and monitoring systems on the use of antimicrobials, and the prevention and control of Antimicrobial Resistance, are weak or inadequate’* (FAO).

***AMR as a threat related to food production systems***

Several international policy documents, including the US NAP, WHO GAP, OIE and FAO, and both Pakistani documents (NSF and NAP) represent AMR as an issue stemming from inappropriate AM use not only in human healthcare settings but also in farming. In the Pakistani documents, the role of food production systems is emphasised and use of AMs in farming is described using defensive language, reminding readers of the positive and negative side of AM use, and that the causal role of AM use in agriculture driving AMR has not been established. In relation to the latter, AM use is justified in relation to increased demand for meat globally: ‘The use of antimicrobial agents in animals, poultry and agriculture has benefits but overuse has potential implications for human health with sharp rise because of high global demand’ (NSF). Similarly, the FAO emphasises that use of AMs is essential for food production systems and safe food but also on animal health, while conceding as a second point that AMR poses a risk:

*‘…access to effective antimicrobial agents constitutes a prerequisite for productive and sustainable agriculture...but that hard-won gains in animal and human health and development are at risk due to increasing resistance to antimicrobials.’* (FAO)

In contrast, the US NAP is bolder than the Pakistani documents in highlighting ramifications of the mass treatments with antimicrobials of groups of farm animals: ‘Because antibiotics in feed or water are typically administered to herds or flocks of food-producing animals, in-feed or in-water antibiotic use leads to an increased risk of selecting for resistance’. The WHO GAP mentions the contentious issue of use of AMs as growth promoters:

*‘Antibiotics are needed to treat sick animals but are also widely used in healthy animals to prevent disease and, in many countries, to promote growth through mass administration to herds’.*

Here the O’Neill report again presents the role of, and solutions to, misuse of AMs in agriculture through an economic (incentives) lens:

*‘simply telling farmers to reduce the amount of antimicrobials they give their animals, without ensuring their incentives are aligned to do this, and without technical assistance, will not yield the changes that we need.’*

Unlike the NSF and FAO document, the O’Neill report takes a harder view on the measures to reduce AM use in food production:

*‘increasing the cost of antibiotics for animal use may discourage unnecessary use and encourage better animal stewardship practices, without compromising animal health or food security.’*

**DISCUSSION**

Our analysis reveals that AMR was dominantly framed as a threat to human health security and economic progress. The O’Neill report in particular presented the likely economic effects of AMR by 2050 as one of its headline findings (O’Neill 2016). Several US, UK and international documents, such as the JEE and FAO, depicted LMICs as the source of the threat. By implicitly defining AMR as a global threat emerging from LMICs, this narrative leverages action and investment by HICs in LMICs to combat AMR early in sight of protecting national economic and social interests in HIC contexts. While positioning AMR in terms of ‘security’ and ‘economic impact’ in global reports may have been successful in achieving political prioritisation amongst global policy actors, each way of framing AMR has implications in terms of the increase in attention and suggested solutions. Specifically, as health security and economic frames tended to dominate the policy documents, the social justice and equity dimensions of the problem are less frequently discussed as reasons to address the growing burden of AMR. Phrasing on human development impacts of AMR, for instance, rarely mobilised human rights-based framing which is frequently used when describing other health issues, such as Universal Health Coverage or HIV (Ferreira 2002; Backman et al 2008).

As summarised in the introduction, framing a policy problem involves emphasizing some aspects of a perceived reality so as to suggest a particular definition of the problem and thereby a proposed solution (McCombs 2005). Thus, by defining the problem of AMR in terms of security and economic factors, equity issues and health systems weaknesses relating to AMR – i.e. the fact that in many LMICs access to appropriate AMs is inadequate leading to avoidable morbidity and mortality in particular in children, and that large populations have poor access to quality healthcare and so have no choice but to use untrained, informal healthcare providers – have been largely neglected in proposed strategies to address AMR. Framing in terms of equity is particularly relevant in the context of AMR as one of the major mitigation strategies centres on the responsible use of AMs. Strategies to curtail inappropriate use of AMs takes place in many LMICs contexts where populations are also lacking access to the medicines they need. Moreover, it is at present unclear how any new AMs developed would be equitably accessible.

In addition to broader health justice narratives, vested political and economic interests are rarely considered across the documents as a critical component of the AMR problem, despite playing an important role in the AMR policy process (Byarugaba 2004; Smith and Coast 2002; Hanefeld et al 2017). For example, many of the drivers of AMR - such as use of AMs as antibiotic growth promoters and unethical marketing by pharmaceutical companies - are not addressed in potential strategies to tackle AMR. This suggests hidden interests and practical considerations may be at play in formulating these strategies. It is important here to acknowledge a difference in nuance between international documents when approaching issues related to political economy. The WHO GAP and the Pakistani NAP, for example, acknowledge the financial power and role of the pharmaceutical industry, whereas the JEE and US NAP pay little attention to such issues. Interestingly none of these documents offer a convincing explanation of how these may impact on responses to AMR, or detail any solution around how these issues could be addressed. This invariably will mean that issues around power and vested interests remain unresolved and are likely to pose further challenges to implementation of and hinder the impact of interventions. Furthermore, although economic arguments about AMR are prominent, their presentation varies. The UK strategy and US NAP make a clear economic argument for immediate investment to address AMR to avoid future expenditure while the WHO GAP speaks of the more general costs incurred through health expenditure and illness, rather than seeking to specify a specific time period.

Another finding that can only emerge from comparing policy documents ‘owned’ by a diverse set of actors is how national governments frame their respective roles and responsibilities. While the US and UK documents tended to position LMICs as reservoirs of AMR that they must provide support to, the NSF in contrast acknowledges Pakistan’s efforts as one amongst other countries and emphasises the need for collective action to address AMR effectively. The language used in the Pakistani documents may suggest that there has been pressure on Pakistan to follow best practice and meet international norms, with the support of international organisations. The US NAP and UK Strategy use terms such as ‘co-operation’, whereas the Pakistani documents talk about international obligations and regulations and ensuring that the country follows and meets these. Throughout the texts the government of Pakistan represents itself as taking an active, responsible role in global relations and be a trustworthy, accountable member of the international community. However, the fact that AMR is not mentioned at all in the country’s overarching health policy document indicates that international pressures may be pulling Pakistan towards health issues that may not otherwise be a domestic priority (Government of Pakistan 2016b).

Similarly, conflicting perspectives with respect to the relationship between AMR and food production were revealed by differences in framing we identified. There appeared to be difference in framing by human health and animal health oriented organisations. The OIE and FAO emphasise the *impact* of AMR on food production whereas other documents, such as the US NAP, position intensification of food production systems as *drivers* of AMR owing to overuse of AMs often as replacement for good farm management and animal husbandry practices. As such, there is a difference in presentation of food production as a victim or culprit of AMR. The WHO GAP and O’Neill report tackle the contentious issue of antibiotic growth promoters in animal feed head-on, while Pakistani documents acknowledge this in much more limited terms. This very much reflects the internal power dynamics in Pakistan, especially the power of livestock producers; the poultry industry in Pakistan, for example, is the second largest in the country and contributes substantially to employment and economic growth. It may also reflect the issues of food security that face many sections of the Pakistani population, whose low income means they are less concerned with AMR in the near future and more with the reality of dealing with food insecurity and malnutrition on a day-to-day basis (Khan et al 2018b).

When comparing the frames we identified with those from a study mapping global frames on AMR (Wernli et al 2017), we identified some similarities, differences, and omissions. First, stunting of human development and health security were present in both the global and the LMICs frames. The frame on AMR as a threat related to food production identified in LMICs was also similar to the One Health frame identified in the Wernli paper (Wernli et al 2017). However, in a LMIC setting the role of the environment in combating AMR was lacking in all of the reports analysed, while the environment and its relationships to AMR was mentioned in a few of the global reports. Second, the economic impact of AMR and the consequences for health equity, two of the key frames identified in LMICs, were not that prominent in Wernli’s global framing analysis (Wernli et al 2017). Finally, two of the frames included in the Wernli analysis were not as prevalent in our study. These included exploring AMR as a healthcare policy issue where AMR was seen as a biomedical problem within the context of healthcare facilities and a second frame seeing AMR as an innovation issue highlighting the need for research and development of products. These differences highlight that in LMICs issues of equity, human development and threats to food security play a much more crucial role in framing AMR than perhaps focusing on the need for innovation or prioritising a biomedical approach to combating AMR, issues more often cited in global and HICs documents.

This study, which examined how one LMIC government is positioning AMR in national policy documents and contrasted this with frames used in international policy documents, demonstrates that important insights can be uncovered through framing analyses. A strength of this paper is that we did not take a purely deductive approach and therefore may have captured new frames used for AMR in different contexts or types of publications. We also felt that we benefited from convening a team of researchers with diverse disciplinary backgrounds and health area expertise, to help us identify potentially relevant themes that were not included. We acknowledge some important limitations, for example the fact that policy documents from HICs beyond the UK and US (such as Japan and Singapore) could not be included. We also note that in wanting to position this paper around one high burden LMIC – Pakistan, we were bound by the availability or lack thereof of policy documents from Pakistan. As a result, our sample of policy documents analysed is shaped by this criterion. Future research could include framing analysis of media transcripts (such as radio, newspapers and social media), which is often under-represented in heath policy and systems research. The frames used by different stakeholder to represent AMR will likely interact with each other or be constructed collectively when organisations have strategic partnerships. Although such an analysis was beyond the scope of the present study, we recognise that important insights could be gained from a study of where frames come from and the extent to which they are collectively constructed. We also recognise that interpretation of the language could have been influenced by the researchers’ positionality.

**CONCLUSIONS**

The complex drivers of AMR, the extent to which these are intertwined with economic interests of the pharmaceutical and livestock industry, and the concomitant lack of clear-cut solutions means that no single coherent narrative on AMR has emerged to date. Our analysis demonstrates that multiple frames are being employed by various actors to present AMR as a critical issue deserving attention from the global health community. However, the framing of AMR in terms of economic cost and human health security is dominant across the texts albeit not presented in a cohesive manner. Impact of AMR on human development and equity is less commonly used to galvanise action to address AMR. One of the challenges is that the selection of frames used when discussing AMR means certain policy options or solutions to addressing AMR may be selected above others, including where these may not be reflective of the complex reality of addressing AMR. There are initial indications that this combination of frames being mobilised may be shaping how policy responses to AMR are considering interests of LMIC and HIC. Specifically, it appears that that LMICs are being positioned as reservoirs and “hotspots” of AMR that HICs need to monitor through surveillance and channel funding towards in order to protect themselves from imminent imported cases of AMR. Selection of a dominant frame is at the expense of others, frames which may not resonate in LMICs. For example, there was little attention to improving health systems, food security or access to water and sanitation more broadly in LMICs. By comparing framing of AMR across policy documents written by a range of stakeholders we were able to uncover similarities and differences in narratives emphasised by international versus Pakistani documents and animal health versus human health focused stakeholders that may reflect variations in underlying values or interests that affect prioritisation of AMR. Looking ahead, we suggest that while the portrayal of AMR as a threat to economic growth and health security of HICs has been successful in drawing high level political attention to this issue, the absence of a unified narrative that combines human interests and economic ones means that actions on AMR may be fragmented.

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