

Antibiotic resistance (ABR) - no sustainability without antibiotics

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INTRODUCTION

Antimicrobial resistance (AMR) is a **missing topic** in the Sustainable Development Goals (SDGs). One can visualize easily terrifying consequences on mankind by not attributing this issue global attention it deserves. It threatens to undermine the effectiveness of modern medicine and with ever-rising number of resistant bacterial strains (WHO, 2014; CDC 2013) it could mean the undoing of much of the progress made under the MDGs. Resistance to antimicrobial drugs already causes an estimated 700 000 deaths annually and – without effective action – is predicted to cause 10 million deaths annually and cost up to US \$ 100 trillion by 2050 (Review on Antimicrobial Resistance, 2014). Thus it is not only a public health issue but it is also critical to the global development progress.

The SDGs should emphasize antimicrobial resistance as a threat to global health that must be overcome. As an example, several of the planned **targets in the health-dedicated goal three** from the SDGs current list will be **impossible to achieve without effective antimicrobials**, e.g. maternal mortality ratio, newborn and under-five children mortality, communicable diseases epidemics, and a significant part of NCDs (Laxminarayan et al., 2013). **Health systems will not be sustainable without effective antimicrobials**, specifically antibiotics (Tomson & Vlad, 2014).

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Analogies with other fundamental global concerns **such as climate change** can help us understand the actual scope and irreversible consequences man can face if radical action is not taken (Laxminarayan et al., 2013). **The golden era** of effective antibiotics is today **history** and the world has to deliver one holistic solution (Nathan & Cars, 2014).

CHALLENGES OF TACKLING ABR

There are several obstacles to finding solutions to the problem of antibiotic resistance (ABR).

First, is the challenge of the complexity of the problem. One reason for the global **complacency of reacting to ABR** is that it is a concept rather than a disease. Yet it undermines effective treatment of many common infections such as pneumonia, wound infections, urinary tract infections, as well as procedures, namely cancer treatment, organ transplants and complicated deliveries (Laxminarayan et al., 2013).

Furthermore, ABR is part of a larger ecological phenomenon and thus not amenable to easy technical interventions. All use of antibiotics contributes to resistance, so the exact role of antibiotic use in human health or animals and food production in driving the spread of resistance in the ecosystem must be properly understood and addressed. Also, a vast majority of bacteria are essential for life and the health of humans, animals and the ecosystem and only a very small percentage of them cause disease. This implies that treatment of infectious diseases should be optimized in a way that they do not make the cure worse than the disease. (ReAct, 2014a)

Secondly, antibiotic resistance is a problem on a global scale, with resistance originating in one part of the world **spreading rapidly**, in some cases in a matter of weeks (Cars et al., 2008).

Intensified human mobility and food trade accelerate the spread of ABR across national borders, across different bacterial species and from bacteria in animals to those in humans. **Responding to outbreaks of resistant infections involves coordination of efforts** across national boundaries, varied health systems and involving international agencies like the WHO. (MacPherson et al., 2009)

Along with the scale of the issue there is also the great diversity of social, economic, political and cultural contexts in which ABR emerges or spreads. For instance, while legal regulation of antibiotic sales or usage has worked well enough in certain parts of the world, in other parts such restrictions are difficult to implement in practice (ESRC Working Group, 2014). **Abuse or overuse of antibiotics in just a few regions of the world is enough to overturn achievements in containing ABR elsewhere** (Nathan & Cars, 2014).

Next is the issue of financial and scientific roadblocks to the development of new classes of effective antibiotics. Developing new drugs is highly resource intensive and private industry does not seem to have the incentives to get involved beyond a point. Partnerships between the private and public sector for such drug development are too few and far between. **Even if a new drug is developed, currently there are no strategies to minimize unnecessary use to keep it effective for as long as possible** (ReAct, 2014b).

The absence of efficient and low cost diagnostics is also an obstacle to the ability of physicians to prescribe appropriate antibiotics or even take a decision not to prescribe at all (Okeke et al., 2011).

While excessive use of antibiotics remains a major problem it is also the fact that in the poorer parts of the world there is a lack of access to essential and effective life-saving antibiotics. Increasing resistance levels also result in older, **cheaper antibiotics losing their efficacy**, while newer and significantly more **expensive drugs are unavailable** due to high costs. (ReAct, 2014a)

UNIFYING FACTOR

Globally, the MDGs dealt with only developing countries, and only development issues while in a near future, the SDGs will deal with **all countries** and **sustainable** development. Spread of AMR in both low- and middle-income countries (LMICs) and high-income countries (HICs) endangers continuity of such international mid- and long-term sustainability efforts. Being considered as a concept – not a disease - AMR lacks the global attention it certainly deserves. This in turn creates obstacles in positioning it centrally in international development agenda.

From the aid and development perspective, **AMR strikes hardest on the poor**. Lack of access to water and sanitation, and to affordable and effective antibiotics significantly affects women and children in Sub-Saharan Africa and other low-income countries (LICs) as well as poorer sections of middle and higher income countries. (Etyang & Scott, 2013)

Weak health systems and unstable central drug distribution systems contribute to shortage of essential antibiotics. ABR should be a priority health concern in LMICs where resistance is at appallingly high levels. In many countries antibiotics are available without any prescription, regulation is weak and counterfeit medicines sometimes account for more than 1/3 of the medicines market (Buckley et al., 2013). These aspects, in combination with poor sanitation, aggravate the problem.

Antimicrobial resistance implies a health, social, and economic problem that LMICs, and the world at large cannot afford.

ISSUES FOR CONSIDERATION

- **Access:** Ensure that effective and appropriate prevention tools, diagnostics and therapies are available and affordable to everyone, everywhere;
- **Conservation:** Reduce the need for antimicrobials and ensure their appropriate use, through disease

surveillance and prevention, infection control, and appropriate use of antimicrobials;

- **Innovation:** Invest in the next generation of antimicrobials, vaccines, diagnostics, and infection control technologies funded by novel business mechanisms; **Lasting political will:** Include AMR in SDGs in both targets and indicators to assure long-term global collective action.

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