



Objective Assessment of Countries' National Action Plans on Antimicrobial Resistance

*Jung Hun Lee¹, Tae Yeong Kim¹, Kyung-Min Jang¹, Jeong Ho Jeon¹, Young Bae Kim², Byeong Chul Jeong¹, *Sang Hee Lee¹*

1. National Leading Research Laboratory, Department of Biological Sciences, Myongji University, Yongin, Gyeonggido 17058, Republic of Korea
2. Biotechnology Program, North Shore Community College, 1 Ferncroft Road, Danvers, MA 01923, USA

***Corresponding Author:** Email: sangheelee@mju.ac.kr

(Received 15 Feb 2020; accepted 24 Feb 2020)

Dear Editor-in-Chief

To tackle antimicrobial resistance (AMR) through a multi-sectional One Health approach (1-3), more than 30 countries (as of Oct 2019) such as Austria, the USA, Argentina, the UK, Pakistan, and South Korea have established their own AMR national action plans (NAPs) (4-6). Furthermore, the first comprehensive governance framework to offer guidance for the development and assessment of AMR NAPs was reported (7). In the next step, the objective assessment of countries' AMR NAPs based on the governance framework is needed to improve the governance of AMR NAPs. Here, we assessed the Korean AMR NAP (4, 6) using this governance framework without the possibility of misleading conclusions, and examined whether major shortcomings are present in our current AMR NAP (4, 6).

First, the governance framework consists of 52 indicators that are grouped into three main governance areas (policy design, implementation tools, and monitoring and evaluation) (7) but our AMR NAP is composed of 18 indicators (6), resulting in the insufficient functionality in the 'monitoring and evaluation' area and then show-

ing less cyclic (dynamic) nature. The governance framework is an ongoing process but our AMR NAP is more static. For continuous improvement of our AMR NAP, this point should be addressed in the current and/or future long-term AMR NAP.

Second, there is no determining who is ultimately responsible for the successful governance of our AMR NAP in the Korean 'policy design' area. The most important consideration for the successful governance of an AMR NAP is not to write a NAP but to implement the NAP, as noted by the Interagency Coordination Group on Antimicrobial Resistance (8). Furthermore, our AMR NAP puts too little priority on the non-therapeutic AMR research such as studies understanding the drivers of AMR emergence and spread. This is the reason why the number of multidrug-resistant microorganisms and AMR outbreaks have not been sufficiently reduced although the annual investment for combating AMR has increased.

Third, addressing governance issues does not only rest on the actions of government but also on other societal organizations, and AMR re-



search should include inputs across social sciences, behavioral, economic, and medical research (7). A further limitation of our AMR NAP is related to too little priority on social and behavioral research.

Finally, after each country assessed each AMR NAP based on the governance framework like us, detailed assessment results (or lessons) need to be incorporated into current initiatives such as the WHO Joint External Evaluation tool (9) or the global tripartite database on country process (10). This is because feedback from many countries could enhance and strengthen the first comprehensive governance framework.

Acknowledgements

This work was supported by research grants from the Bio & Medical Technology Development Program of the National Research Foundation of Korea (NRF) funded by the Ministry of Science and ICT (MSIT; grant No. NRF-2017M3A9E4078014); the NRF funded by the MSIT (grant Nos. NRF-2021R1A2C3004826 and NRF-2019R1C1C1008615); and the Korea Centers for Disease Control and Prevention (grant No. 2017ER540402). The funders had no influence on the design, collection, analysis and interpretation of the data, writing of the report, and decision to submit this article for publication. Jung Hun Lee, Tae Yeong Kim, and Kyung-Min Jang contributed equally to this work.

Conflicts of interest

The authors have no conflict of interest.

References

1. Van Boeckel TP, Pires J, Silvester R, et al (2019). Global trends in antimicrobial resistance in animals in low- and middle-income countries. *Science*, 365: eaaw1944.
2. Lee JH, Park KS, Jeon JH, Lee SH (2018). Antibiotic resistance in soil. *Lancet Infect Dis*, 18: 1306-1307.
3. Chatterjee A, Modarai M, Naylor NR, et al (2018). Quantifying drivers of antibiotic resistance in humans: a systematic review. *Lancet Infect Dis*, 18: e368-e378.
4. Ryu S (2017). The new Korean action plan for containment of antimicrobial resistance. *J Glob Antimicrob Resist*, 8: 70-73.
5. Joint Programming Initiative on Antimicrobial Resistance (2019). National AMR Plans and Research Programs Library. <https://www.jpamr.eu/activities/alignment-actions/alignment-plan/>
6. Joint Programming Initiative on Antimicrobial Resistance (2016). National Action Plan on Antimicrobial Resistance. <https://ncdc.gov.in/WriteReadData/1892s/File645.pdf>
7. Anderson M, Schulze K, Cassini A, Plachouras D, Mossialos E (2019). A governance framework for development and assessment of national action plans on antimicrobial resistance. *Lancet Infect Dis*, 19: e371-e384.
8. Interagency Coordination Group on Antimicrobial Resistance (2018). Antimicrobial resistance: national action plans. https://cdn.who.int/media/docs/default-source/antimicrobial-resistance/iacg-amr-national-action-plans-110618.pdf?sfvrsn=53e4eb22_4
9. World Health Organization (2018). Joint External Evaluation tool (JEE tool) - second edition. <https://extranet.who.int/sph/joint-external-evaluation-tool-2nd-edition>
10. WHO, FAO, OIE (2018). Country progress in the implementation of the global action plan on antimicrobial resistance: WHO, FAO and OIE global tripartite database.