



Increased importation and use of pesticides in Sierra Leone may lead to a possible increase in antimicrobial resistance

Reference:

Johnson, R.A.B.; Hann, K.; Leno, A.; Timire, C.; Bangura, A.J.A.; George, M.I.Z.; Davtyan, H.; Satyanarayana, S.; Nair, D.; Mansaray, A.H.D.; et al. *Pesticide Importation in Sierra Leone, 2010–2021: Implications for Food Production and Antimicrobial Resistance*. Int. J. Environ. Res. Public Health 2022, 19, 4792.

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Key Messages

- In response to escalating food insecurity, the government of Sierra Leone has dramatically increased the amount of pesticide importation.
- Although the hazard class risk classification of imported pesticides has decreased over time, increasing amounts of imported fungicides and bactericides could increase the risk of antimicrobial resistance among humans.
- The Ministry of Agriculture should combat the issue of illegal pesticide importation and promote pesticide awareness, especially in the districts at the country's borders.

What is the problem and why is it important?

Antimicrobial resistance (AMR) has recently been shown to account for more global deaths than HIV and malaria collectively, and it is in Western sub-Saharan African countries, such as Sierra Leone, that it is associated with the highest rate of age-adjusted mortality. Pesticides that contain antimicrobial substances (insecticides, fungicides, bactericides) can lead to an increase in AMR in the environment directly, and in humans and animals indirectly.

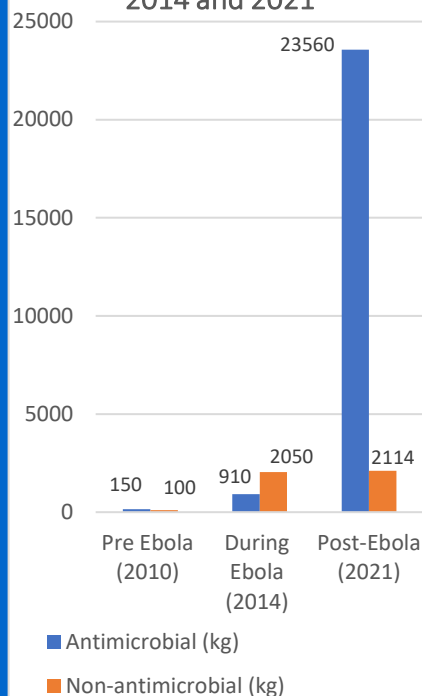
It is crucial for countries to routinely monitor pesticide use, particularly for pesticides that have antimicrobial properties. The National Action Plan on AMR of Sierra Leone recognises that routine monitoring is required on the levels, trends in sales, and application of pesticides.

How did we measure it?

We used data on pesticides imported into Sierra Leone by the Ministry of Agriculture (MoA), before (2010), during (2014), and after (2021) the Ebola virus disease (EVD) outbreak in Sierra Leone. Importation of pesticides by private entities and illegal importations were not included in this dataset.

Summary statistics were used to quantify the amounts of pesticide importation before, during and after EVD. Importation quantities were compared by region, desired crops, pesticide type and hazard level.

Pesticide importation to Sierra Leone in 2010, 2014 and 2021



What did we find?

- The MAF imported pesticides for farming only during 2010, 2014 and 2021, in response to growing food insecurity and associated with the EVD and COVID-19 outbreaks.
- Pesticide importation increased about 10-fold between 2010 – 2021 (from 6,230 L / 250 kg in 2010 to 51,150 L / 25,674 kg in 2021).
- Importation of antimicrobial pesticides (including fungicides and bactericides) increased more than 150 times between 2010 – 2021 (from 150 kg in 2010 to 23,560 kg in 2021).
- Glyphosate is one of the most commonly used herbicides globally and AMR has risen concurrently since its introduction and escalation. Our study found that glyphosate made up almost 25% of the total herbicidal imports into Sierra Leone.
- Fortunately, the predominant fungicide being imported by the government is a non-azole, which has not yet been closely associated with AMR.
- The chemical hazard class risk classification of imported pesticides decreased over time. In both 2014 and 2021, there were none in the extremely hazardous group, meaning the pesticides were moderately to slightly hazardous.
- However, during field research, it was observed that 50% of the pesticides had leaflets written in French, probably due to importation from Guinea.
- Many street pesticides are sold in unlabelled containers, especially in the border districts (Kambia, Pujehun and Western Area), which are either counterfeit or heavily diluted, and these are leading to poor crop production and food insecurity.

Implications

- The National Pesticide Management Committee has been established but it still has to review the national approved pesticide list.
- The Ministry of Agriculture through the Crop Protection Unit should eradicate the importation of illegal pesticides through effective and regular monitoring and surveillance especially in the border districts.
- There is need for financial and additional technical support to decrease the risk of worsening food shortages and the possible threat of emerging AMR.