

A call for global monitoring of WASH in wet markets



Since the start of the COVID-19 pandemic, wet markets have been described as potential hotspots for the transmission of novel respiratory illnesses. Over the past two decades, wet markets—defined as marketplaces where meat, seafood, produce, and sometimes live animals are sold and butchered at open-air stalls—have been linked to the emergence of the novel influenza virus H5N1,¹ severe acute respiratory syndrome coronavirus 1 (SARS-CoV-1),² and SARS-CoV-2 in humans. Although some global leaders have called for a complete ban on wet markets given the ongoing crisis,³ others have rightfully noted that millions of low-income households across Asia, Africa, and Latin America rely heavily on wet markets for affordable fresh food, and that discounting the numerous socio-cultural and economic benefits that these markets provide would be irresponsible.⁴ Therefore, many global health leaders are now advocating for bans on wildlife trading at wet markets as a defence against future zoonotic outbreaks.⁵

Regardless of the role wet markets will play in future respiratory virus epidemics, wet markets pose additional zoonotic health risks that must be prioritised by global health researchers and policy makers. Specifically, wet markets could be hotspots for enteric pathogen transmission because of poor and unregulated hygiene conditions. For example, faecal bacteria from animals at wet markets can contaminate meat and nearby produce during slaughtering or through cross-contamination of surfaces.⁶ Many markets do not have toilets and handwashing stations; therefore, vendors can contaminate meat and produce with faecal-oral pathogens such as *Escherichia coli* and *Salmonella* bacteria.⁷ A study of markets in Dhaka, Bangladesh found that faecal bacteria from humans and animals were commonly detected on produce that is eaten raw, such as carrots and tomatoes.⁶ Other studies have found that pathogenic bacteria on meat can be drug-resistant, often at rates that are many times higher than the USA.⁷

Building improved wet market infrastructure is urgently needed, particularly in low-resource settings. By installing handwashing facilities and toilets, requiring adequate drainage, separating live animals from meat and produce, and implementing protocols for cleaning food and slaughtering animals, we could transition these settings away from being hotspots for

pathogen transmission and exposure. This approach was successfully implemented following the 2004 influenza A H5N1 epidemic in Hong Kong, where innovative disinfection strategies, such as so-called rest days during which live poultry markets are emptied and systematically cleaned, helped to prevent virus transmission.

If we fail to advocate for major sanitation and hygiene improvements now, the health risks posed by wet markets could worsen. It is likely that more people will migrate to urban areas and slums will grow over the next few decades; therefore, wet markets will be increasingly located in crowded communities with reduced access to piped water and networked sewers. This scenario increases the risks for disease transmission and the propagation of antibiotic resistance.⁸ Meanwhile, the proportion of middle-income families is rapidly growing worldwide, and with it, a voracious demand for meat and fish.⁹ These changes mean we can expect more wet markets, more live animals at these markets, and more opportunities for meat and produce to be contaminated with pathogens over the next decade, if public attitudes remain unchanged.

Encouragingly, the WHO announced in April, 2020, that it is developing food safety and hygiene standards that wet markets must adhere to before re-opening.¹⁰ Guidelines are the first step, but it is difficult to target resources without a comprehensive understanding of the current state of sanitation and hygiene conditions in wet markets. We call for standardised global monitoring of water, sanitation, and hygiene (WASH) conditions at food and live animal markets. Improving market infrastructure, establishing hygiene guidelines appropriate for all countries, and monitoring progress would enable governments and international organisations to decide how best to funnel their resources to protect public health. Currently, the WHO-UNICEF Joint Monitoring Program monitors global progress towards achieving the United Nations Sustainable Development Goal 6 (clean water and sanitation for all) by tracking WASH infrastructure in households, schools, and health-care facilities, but not in markets. Expanding the scope of the WHO-UNICEF Joint Monitoring Program to include wet markets will require more funding. The decision by the USA to withdraw funding from the WHO is

imprudent, and ignores the very real consequences of increasing animal-human connectivity.

Using monitoring data to target wet markets for hygiene and sanitation infrastructure upgrades, while protecting these marketplaces as vibrant, affordable, community spaces should be the global public health community's next major focus.

We declare no competing interests.

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