

Pasteur's legacy in 21st century medicine

The Lancet bids 2022 *adieu* with a commemoration of Louis Pasteur. Born in France on Dec 27, 1822, Pasteur was a young polymath when he embarked on a path of discovery with profound societal relevance. By the age of 40 years, he was a national hero and an international authority on microbiology, vaccines, and immunology. His germ theory of disease laid the foundation for hygiene and sanitation within public and global health. He developed the first vaccine against human rabies in 1885. Along with other great scientists of his time, Pasteur shaped scientific reasoning and communication for the better, creating a legacy that catalysed progress in human health that has been sustained for the past 150 years. Yet infectious diseases continue to cause millions of unnecessary deaths. Even before the COVID-19 pandemic, global burden of disease (GBD) data indicated that infections were involved in more than 20% of deaths globally. A GBD study in this special themed issue of *The Lancet* indicates that 13.6% of deaths globally are associated with just 33 bacterial pathogens.

Throughout this issue, the barriers to realising Pasteur's legacy in combatting infectious diseases become apparent. Alison Holmes and colleagues discuss the technologies and strategies that have advanced infection control and prevention in the context of health-care settings. Most hospital-acquired infections can now be prevented. Yet infection control remains problematic in low-income countries where basic implementation of simple practices is challenging and often left unaddressed. Bernadette Abela-Ridder and colleagues consider the disproportional burden of rabies, which still kills one person approximately every 10 min, in poor settings, despite effective vaccines to break transmission chains between humans and dogs. Salim Abdool Karim and Izukanji Sikazwe discuss the obstruction of Africa's efforts to manufacture COVID-19 vaccines; Giles-Vernick and colleagues discuss the inequities and societal issues that challenge public health measures. It becomes apparent that failures in rendering equal protection to all are consequences of health inequities that are propagated by sociocultural and political environments, civil insecurity, and ineffective messaging and community engagement.

The 21st century is seeing a changing landscape of infectious diseases. Old and new pathogens are emerging under growing pressure of anthropogenic

forces. Climate change is affecting the distribution and transmission of pathogens. Antimicrobial resistance (AMR) and emerging zoonoses are profound threats, now and in the immediate future. More than one million people—a number set to rise—die from bacterial AMR each year, disproportionately affecting people where health care and sanitation infrastructure are weakest. Pandemics will become more common, yet lessons from COVID-19 are being ignored. To combat such threats, the *Lancet* Commission On Lessons For The Future From The COVID-19 Pandemic calls for prosociality, whereby governments and institutions reorient towards multilateral systems that foster international public health collaboration and solidarity.

The unstable social and political context in which we live our lives is creating new public health challenges. An infodemic has seen the rapid spread of misinformation that resonates with people in ways that expert advice does not. Vaccine hesitancy is now a major barrier to fighting infectious diseases, particularly in high-income countries. Many parents are reluctant to vaccinate their children because of concerns about vaccine safety, despite reassurances from doctors and public health authorities. This hesitancy reflects a broader breakdown of trust in the state and in scientists. As Ilana Lowy and William Bynum note, Pasteur crafted his public image to bolster support for his research. He understood the power of knowledge, know-how, and dissemination of information in his relationship with the public. Now, more than ever, the medical research community needs to hone creative and authentic science communication and public engagement skills to rebuild trust with a divided society so their work can save lives.

"In our century, science is the soul of the prosperity of nations and the living source of progress. Undoubtedly, the tiring daily discussions of politics seem to be our guide—empty appearances!—what really leads us forward are a few scientific discoveries and their applications." These words of Pasteur's could not be more poignant in a 21st century shaping up to be dominated by polarising and health-harming politics. Pasteur understood that science is fundamental for human health, and his values—a scientific presence and engagement in public health crises—belong at the heart of efforts against infectious diseases. ■ *The Lancet*



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