Public health

Public health refers to the science and practice of protecting and improving the health of communities through education, promotion of healthy lifestyles, disease prevention, and the control of environmental threats. It focuses on the well-being of entire populations rather than individual health outcomes.

Key components of public health include:

Disease Prevention and Control: Public health professionals work to prevent the spread of infectious diseases, such as through vaccination programs, disease surveillance, and outbreak investigations. They also address chronic diseases through initiatives promoting healthy behaviors and early detection.

Health Promotion: Public health efforts aim to promote healthy lifestyles and behaviors among populations. This includes campaigns to encourage physical activity, healthy eating, smoking cessation, and reducing substance abuse.

Environmental Health: Public health addresses environmental factors that can affect health, such as air and water quality, sanitation, and occupational hazards. Efforts are made to minimize exposure to environmental toxins and pollutants.

Health Equity: Public health advocates for equitable access to healthcare and resources, addressing disparities in health outcomes among different population groups based on factors such as race, ethnicity, socioeconomic status, and geographic location.

Policy Development: Public health professionals work with policymakers to develop and implement policies that promote health and well-being at the community, national, and global levels. This may include legislation on issues such as tobacco control, food safety, and workplace health and safety.

Emergency Preparedness and Response: Public health agencies prepare for and respond to emergencies and disasters, such as natural disasters, disease outbreaks, and bioterrorism events. This involves coordination with other agencies and organizations to ensure effective response efforts.

Research and Surveillance: Public health research generates evidence to guide policies and interventions, while surveillance systems monitor health trends and track the spread of diseases and other health-related issues.

Overall, public health plays a critical role in promoting population health, preventing disease, and improving the quality of life for communities around the world. It involves collaboration among governments, healthcare providers, community organizations, and individuals to address complex health challenges and achieve better health outcomes for all.

The Coronavirus Disease 2019 (COVID-19) pandemic has revealed major shortcomings in our ability to mitigate transmission of infectious viral disease and provide treatment to patients, resulting in a public health crisis. Within months of the first reported case in China the virus has spread worldwide at an unprecedented rate. COVID-19 illustrates that the biomaterials community was engaged in significant research efforts against bacteria and fungi with relatively little effort devoted to viruses. Accordingly, biomaterials scientists and engineers will have to participate in multidisciplinary antiviral

research over the coming years. Although tissue engineering and regenerative medicine have historically dominated the field of biomaterials, current research holds promise for providing transformative solutions to viral outbreaks. To facilitate collaboration, it is imperative to establish a mutual language and adequate understanding between clinicians, industry partners, and research scientists. In a article, of Chakhalian et al. clinical perspectives are shared to clearly define emerging healthcare needs that can be met by biomaterials solutions. Strategies and opportunities for novel biomaterials intervention spanning diagnostics, treatment strategies, vaccines, and virus-deactivating surface coatings are discussed. Ultimately this review serves as a call for the biomaterials community to become a leading contributor to the prevention and management of current and future viral outbreaks [1].

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Chakhalian D, Shultz RB, Miles C, Kohn J. Opportunities for Biomaterials to Address the Challenges of COVID-19 [published online ahead of print, 2020 Jul 14]. J Biomed Mater Res A. 2020;10.1002/jbm.a.37059. doi:10.1002/jbm.a.37059