

SOUND, WELL, & WHOLESOME WITH SDG 3

Dr. Shaper Mirza is an accomplished researcher with a proven track record of impactful multidisciplinary research in immunology, microbiology, computational biology, and bioinformatics. Dr. Shaper's work has had great implications in terms of development and practical implications. She has integrated multiple disciplines within her studies to present a holistic picture of immune impairments and their association with infectious diseases. Her studies on Pneumonia, diabetes, and antimicrobial resistance, have laid the foundations for the field of microbial pathogenesis within the region. Dr. Shaper's translational research in diabetes has had major implications within policy and primary care. Her research is highly significant in guiding the policymakers in Pakistan

IMMUNIZATION AGAINST PNEUMOCOCCAL INFECTIONS

In Pakistan, there are no recommendations for the immunization of adults for flu shots and immunization against pneumococcal infections. This is due to the lack of evidence for the role of the pneumococcal vaccine in the protection against pneumococcal infections in diabetes. Dr. Shaper's current research involves investigating the immune response to the pneumococcal conjugate vaccine in those with and without diabetes. Her studies will be the first from Pakistan to present a holistic overview of both humoral and cellular responses to the pneumococcal conjugate vaccine in diabetes. Additionally, she is investigating the immune efficacy of the pneumococcal vaccine in children, by measuring titer to the vaccine and studying the biology of strains that are causing carriage in children, in a post-vaccine era.



Multidisciplinary Research

- Analysis of antimicrobial resistance: used as a framework for formulating national action plans to lower the burden of antimicrobial resistance in Pakistan.
- Molecular deviation of immune function in diabetes: a critical translational discovery, especially with Pakistan having a high incidence of diabetes.
- Monitoring the changing antibiotic resistance: crucial for different pneumococcal variants.
- Measuring immune response to pneumococcal polysaccharide vaccines: determining their ability to mount an effective immune response to local isolates of the pathogens.

RESEARCH COLLABORATIONS

- **Global Pneumococcal Sequencing (GPS) grant**

Dr. Shaper has established the Genomic surveillance of *S. pneumoniae*. The project was funded by the Bill and Melinda Gates Foundation and subcontracted to LUMS by Wellcome Sanger Center. The preliminary results of this project identified novel genotypes that were associated with colonization in Pakistan. Serotype replacement and antimicrobial resistance in strains of pneumococci was other important aspect of this study. Data generated from this study was instrumental in understanding the impact of vaccines in Pakistan.

- **Institute of Public Health:**

Evaluation of efficacy of pneumococcal vaccine Carriage rates by vaccine strains in children Covid-19 surveillance Maternal and Child Health.

- **Shalamar Hospital:**

Immune responses in diabetes to pneumococcal infections and vaccination.

- **Services Institute of Medical Sciences:**

Clinical characteristics of patients hospitalised with moderately severe and severe Covid infections. PKLI- Diabetes, pneumonia and Covid.

She is a part of STEM program Pakistan and sits on Technical Advisory Committee-Punjab AIDs Control Program, Technical Advisory Committee- National Health Research Committee.

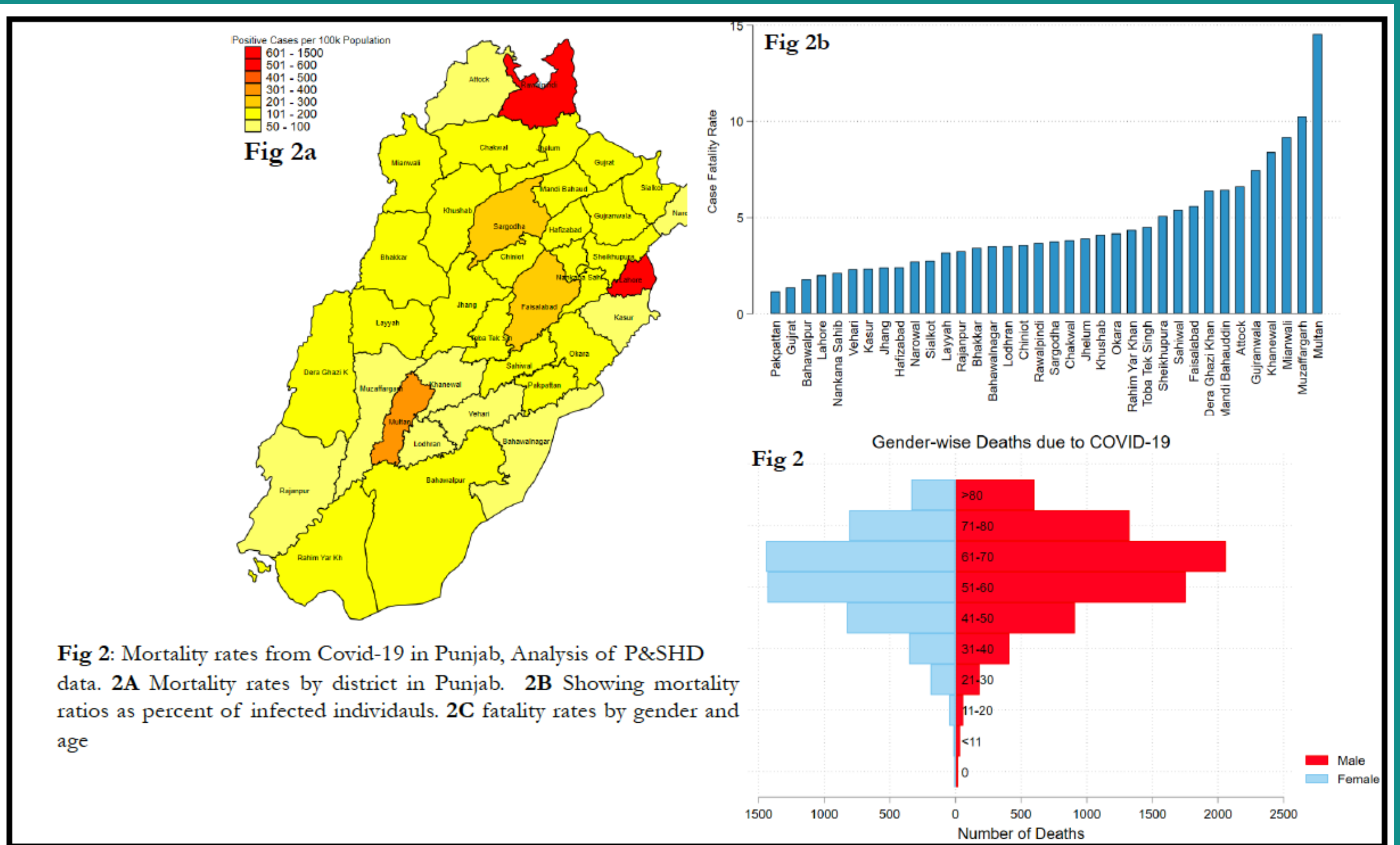


Fig 2: Mortality rates from Covid-19 in Punjab, Analysis of P&SHD data. **2A** Mortality rates by district in Punjab. **2B** Showing mortality ratios as percent of infected individuals. **2C** fatality rates by gender and age

ABOUT



Dr. Shaper Mirza is currently working as an Associate Professor in the Department of Life Sciences at Syed Babar Ali School of Science and Engineering - LUMS. She holds a BSc (Hon) degree from the University of Karachi and a doctorate from The University of Alabama at Birmingham (UAB). Her Ph.D. studies involved understanding the mechanisms of nasal colonization by a Gram-positive Pathogen *Streptococcus Pneumoniae*. She continues to develop her studies on the association of immune impairments in diabetes with pneumococcal infections.

Along with teaching at LUMS, she has also developed a lab that is currently investigating the role of hyperglycemia, characteristic of type-2 diabetes in the impairment of immune functions of neutrophils and CD4+T cells. Dr. Shaper is a part of many research and educational boards & committees. She is a recognized researcher and has authored several papers in high-impact factor journals and serves as an editor for two journals.