STUDENTS' CORNER
LETTER TO THE EDITOR

The role of big data analysis for resources optimization of immunization programmes in Pakistan

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Dear Madam, The significance of Big Data Analysis (BDA) in optimizing immunization programmes in Pakistan emerges within the context of global and regional immunization challenges of the post COVID-19 pandemic. Despite recovery efforts, a substantial number of children globally remain under-vaccinated, with 14.3 million zero-dose children in 2022.[1] South Asia, primarily India, has shown notable progress, exceeding pre-pandemic coverage levels.[2] In Pakistan, the Expanded Programme on Immunization (EPI) launched in 1978 aims to combat high under-five mortality rates due to vaccine-preventable diseases.[3] However, vaccine coverage remains suboptimal, with only 66% of children aged 12-23 months receiving basic EPI vaccines.[3] This is compounded by reduced doses administered later in schedules, influenced by limited access, awareness gaps, and insufficient vaccinators, especially in rural areas.[3] Big data analytics can help tackle challenges, improve resource allocation, and optimize immunization in Pakistan.

The vital role of BDA in optimizing Pakistan's immunization programmes is rooted in its manifold health benefits. BDA aids disease prevention, identifies health risk factors, and enhances healthcare strategies.[4] Amid health emergencies like COVID-19, BDA leverages information technology to fortify health systems, enhancing decision-making, reducing errors, and conserving resources.[4] BDA's dynamic potential is evident. Its predictive tools swiftly pinpoint high-risk patients, streamlining care and elevating healthcare outcomes.[4] BDA draws insights from vast datasets for informed decisions. A recent study conducted in Sindh, increased vaccinator attendance from 44% to 88%, by factoring in results of BDA of Electronic Immunization Registries into their decision making.[5] BDA of antigen administration during accelerated outreach efforts revealed substantial boosts, compared to routine activities.[5] These findings spurred continued efforts in high-risk areas, showcasing BDA's impact in project acceleration and resource optimization.[5] This case highlights BDA's transformative role, enhancing immunization programmes through data-driven insights.

To harness the potential of BDA in immunization, Pakistan's healthcare system requires a digital overhaul. This entails prioritizing active patient data collection, storage, and analysis on a national scale. Collected data would facilitate targetted vaccination efforts in vulnerable areas. Storing data supports future research and predictive analysis, offering insights into current measures' efficacy and enabling necessary adjustments. A robust data analysis infrastructure, coupled with healthcare professional training, is essential. Cost-effective data security is vital. Digital registries in tertiary care hospitals and rural centres can aid government analysis. This holistic approach seeks to establish a digital healthcare ecosystem, involve the public, and implement data-driven solutions for improved immunization and overall public health in Pakistan.

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