Table 3 **Barriers to achievement of universal vaccination in Pakistan and potential avenues for action**

Theme	Challenges	Recommendations
Programme structure and management	• Ambiguous division of roles and responsibilities of EPI activities following the 18th Amendment of the Constitution of Pakistan • Common pool of funds at district level, making EPI a competitor for funds and making allocations discretionary	• Development of a renewed scope of work and provincial procedures for accountability and monitoring structures for different tiers and actors involved in EPI service provision • Introduce activity-specific funding for all health programmes including immunization at district level to ensure adequate capitalization for target achievement
Programme governance and capacity	• Limited managerial capacity and trained human resources for programme implementation at district and sub-district levels • Poorly implemented structures of accountability exacerbated by political patronage and interference	• Regular, level-specific training for managerial tiers institutionalized by district and provincial health departments • Institutional strengthening with improved monitoring and accountability of concerned cadres of managers and frontline workers
Human resources	• Lack of rational deployment of trained human resources • Lack of refresher training of health care providers on vaccine-preventable illnesses, newer vaccines, communication skills and adverse events reporting • Poor coordination among different cadres of field-based staff	• GIS mapping of human resources and catchment populations for rational redeployment • Employee development initiatives with official avenues for regular training and skill development • Implementation of collaborative planning, micro-plan development and service provision at community level among frontline workers. Members of community may be involved to enhance development of collaborative and needs-responsive micro-plans
Vaccine logistics	• Centrally driven demand estimation based on historical trends of inconsistent data • Poorly sustained cold-chain maintenance	• Rationalize demand estimation based on locally available facility- and community-based databases • Regular mapping of cold-chain assets with identification of non-functional units for repair/replacement • Development of local (district/sub-district) funds for cold-chain repair and replacement
EPI management information system	• Poor record-keeping in EPI management information system and limited utilization of submitted data for decision-making • Absence of feedback at district level for improving data quality	• Establishment of district data-cells to conduct regular sub-district surveys to obtain accurate estimates of vaccine coverage • Rationalization and revision of paper based management information tools • Adoption of mobile device-based technology for rapid service data collection • Rigorous and regular assessment of submitted service data, with timely feedback to improve and maintain data quality
Poor community uptake of vaccinations	• No appreciable increase in vaccine uptake among illiterate and low-income segments of society • Poor communication skills of health care providers and high rate of missed opportunities • Cultural and religious myths propagated by influential community leaders to prevent uptake of vaccination	• Development of evidence-based communication packages focusing on service uptake among different segments of society, e.g. rural populations and people with low literacy • Regular training of health care providers to enhance technical knowledge, communication skills and staff attitudes regarding vaccination services • Provision of effective communication materials for use by health care providers and for distribution among parents • Engagement of community and religious leaders to lend public support to religious instruction activities in the local context • Introduction of EPI services in health facilities where they are currently not offered • Visible, well-lit signboards identifying EPI centres at health care facilities and conveying information about the centre and services provided

EPI = expanded programme on immunization; GIS = geographic information system.