POLICY BRIEF

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Beyond Imports and Exodus:

How Technology Can Make Pakistan's Specialist Care Self-Reliant

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Policy Brief

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1. Introduction

Two things that Pakistan does not fully control hold up its specialized healthcare. The first is equipment. By industry estimates, the country imports more than 90 percent of its medical devices and diagnostic equipment, mainly from the United States, the United Kingdom, Germany and China, and spends about US$1.1 billion a year doing so (Saeed, 2023). The second is people. Drawing on Bureau of Emigration records, Gallup Pakistan found that between 3,800 and 4,000 doctors formally left the country in 2025, the largest annual outflow on record (Bhatti, 2026a).

Each problem worsens the other. After foreign exchange reserves collapsed in late 2022, the government restricted imports, and hospitals and laboratories began rationing devices and diagnostic products. At the time, the secretary-general of the Pakistan Medical Association told reporters that "stents for heart patients and necessary equipment for ventilators are unavailable in the market" (Saeed, 2023). Skilled staff cannot run a cardiac unit that has no stents. Nor can they keep an intensive care unit going without ventilator parts. The reverse holds as well: a well-equipped unit with no specialists sits idle.

Two connected questions shape this brief. How can telemedicine, artificial intelligence (AI), digital health records and locally engineered equipment stretch Pakistan's small pool of specialists and bring advanced care to patients beyond the major cities? And what would Pakistan need in order to build more of this technology itself, rather than buying it in every crisis at whatever price and on whatever terms the global market sets? The sections that follow describe the current situation, show where technology already helps and where it stalls, identify the main obstacles, and close with recommendations for federal and provincial policymakers.

2. Background

2.1 A thinly funded system

Public spending on health in Pakistan remains low. The Pakistan Economic Survey 2025-26 reports that consolidated federal and provincial health expenditure reached Rs 942.2 billion in FY2025, a rise of just 1.9 percent on the previous year, while public health spending stood at 0.8 percent of GDP (Finance Division, 2026). Development budgets are tighter still. Health projects in the federal Public Sector Development Programme carry an approved cost of Rs 363.5 billion;

against a remaining throw-forward of Rs 318.1 billion, however, the FY2026 allocation is only Rs 19.4 billion (Finance Division, 2026). At that rate, finishing the existing pipeline would take well over a decade. New technology projects would have to queue behind it.

Outcomes mirror this underinvestment. In 2024, life expectancy in Pakistan stood at 67.8 years against a South Asian average of 72.6, and infant mortality ran at 47 per 1,000 live births, compared with 23.2 across the region (Finance Division, 2026). The 2025 Sustainable Development Report placed the country's universal health coverage service index at 45.2 out of 100. It also put the age-standardized risk of dying between 30 and 70 from cardiovascular disease, cancer, diabetes or chronic respiratory disease at 25.5 percent (Finance Division, 2026). Such non-communicable diseases demand precisely what the system lacks: specialist diagnosis and long-term specialist management.

2.2 More doctors on paper than at the bedside

The registers tell a story of steady growth. In 2025, Pakistan had 336,582 registered doctors and 138,391 registered nurses, or roughly 698 people per registered doctor, and its 1,934 hospitals offered one bed for every 1,328 people (Finance Division, 2026). According to the Pakistan Medical and Dental Council, about 22,000 new doctors join the register each year (Bhatti, 2026a).

Registration does not equal practice. Medical associations estimate that around 70,000 women doctors appear on official registries without working, and survey evidence suggests that more than a third of female medical graduates never enter the profession or leave it after marriage (Agence France-Presse [AFP], 2026). Emigration has climbed as well. Annual departures of doctors first crossed 1,000 around 2010; by the mid-2010s they ranged between 1,500 and 2,000, and they reached roughly 2,800 by 2020 before approaching 4,000 in 2025 (Bhatti, 2026a). Among those who leave or stop practising are many of the trained, experienced clinicians on whom specialist services depend.

Specialties and the periphery feel the shortage most. Azad Jammu and Kashmir, for instance, has 436 specialists for the entire region, or 0.95 specialists per 10,000 people (Finance Division, 2026).

2.3 Islands of specialist capacity

Strong specialist capacity does exist, but in pockets that lean heavily on foreign technology. The Pakistan Atomic Energy Commission runs 21 cancer hospitals. By official estimates, they handle about 80 percent of the country's cancer burden and perform more than one million radiotherapy, radiology and nuclear medicine procedures each year (Finance Division, 2026). Yet the Economic Survey's list of upgrades for these hospitals reads like a foreign supplier's catalogue: TrueBeam linear accelerators, a new CT scanner, gamma cameras and Roche chemistry analysers. Of their roughly 2,300 personnel, only 30 are engineers (Finance Division, 2026). From so narrow a base, maintaining complex radiation and imaging systems is difficult; designing them lies out of reach.

Provinces have started pushing specialist services outward. Punjab reports that four district-level cardiac catheterization laboratories were running by March 2026 and had performed 1,135 procedures, including 756 angiographies and 379 angioplasties. Over the same period, the province rolled out electronic medical records and integrated them with its health management information system (Finance Division, 2026).

2.4 The policy architecture

Pakistan's digital health policy framework is broad yet incomplete. With the National Health Vision 2016-2025 now expired, its successor, the draft National Health and Population Policy 2026-2035, names "advancing digitization" among its five priorities (Finance Division, 2026). The Ministry of National Health Services, Regulations and Coordination is building a National Digital Health Hub to merge fragmented health information into one interoperable, analytics-driven platform. Even so, the Economic Survey concedes that weak data integration, quality and storage limit existing systems (Finance Division, 2026). A National Digital Health Framework 2022-2030 adopts the World Health Organization's definition of digital health, though no dedicated federal law yet regulates the field (Iqbal, 2024). In July 2025, the federal cabinet approved Pakistan's first National Artificial Intelligence Policy, which lists health among the sectors it aims to transform (Associated Press of Pakistan [APP], 2025).

3. Discussion

3.1 Technology as a multiplier for scarce specialists

Technology does not earn its place in specialized care by replacing specialists. Its value lies elsewhere. It lets each specialist reach more patients, and it equips general doctors and nurses to do more under specialist guidance. For Pakistan, three types of technology matter most.

Telemedicine is the most mature. Sehat Kahani, a Karachi-based digital health company, operates 80 clinics where patients consult a remote doctor while a nurse, physically present, guides the visit. According to its co-founder, the platform has brought 7,500 doctors back into practice, most of them women working from home (AFP, 2026). One doctor profiled had trained in cardiology and quit after marriage; she now consults online from Karachi with patients on the other side of the country (AFP, 2026). Her case carries a lesson for specialist policy. A model that returns general practitioners to work can also return cardiologists, gynaecologists, dermatologists and psychiatrists who have left hospital practice, linking them to district facilities with no specialists of their own. Several private platforms already operate in this space, including Sehat Kahani, Marham, Healthwire, Ailaaj and Dawaai (Iqbal, 2024). The market and the technical capacity exist.

Artificial intelligence opens a second route, especially for screening that currently waits on scarce specialists. Diabetic retinopathy illustrates the point. In 2025, researchers based in Pakistan and Saudi Arabia published a systematic review and meta-analysis pooling 25 studies and 613,690

retinal images. In undilated eyes, AI screening reached a pooled sensitivity of 0.90 and specificity of 0.94, against 0.79 and 0.99 for manual screening. For dilated eyes, AI sensitivity was 0.95 compared with 0.90 for manual grading, although AI specificity fell to 0.87 (Tahir et al., 2025). The authors concluded that AI could lighten ophthalmologists' workload. They also warned of heterogeneity across studies and called for testing across varied image qualities and clinical settings (Tahir et al., 2025).

Two lessons follow for Pakistan. First, the government's national diabetes programme for 2024-2029 includes a national diabetes registry (Finance Division, 2026), which offers a ready channel for AI-assisted eye screening. Second, none of the 25 studies in the review took place in Pakistan; they came from India, China, Singapore, Thailand, Kenya, the United States and several European states, among others (Tahir et al., 2025). Policymakers cannot assume that imported algorithms will perform as well on Pakistani patients, cameras and clinic conditions.

The third technology attracts the least attention yet probably matters most: connected health records. Reviewing a referral, a specialist needs the patient's history, imaging and test results. Punjab's shift to electronic medical records and the federal National Digital Health Hub both point the right way (Finance Division, 2026). Without interoperable data, however, telemedicine dissolves into disconnected conversations. AI tools, likewise, have nothing reliable to learn from or feed into.

3.2 Can Pakistan build its own? What the record shows?

COVID-19 showed that Pakistan can mobilize indigenous capability quickly when government, engineers, regulators and buyers pull together. In July 2020, the National Radio and Telecommunication Corporation opened what officials called the country's first facility for locally made ventilators, producing the SafeVent SP100. It had built 15 units at launch and reported a capacity of 250 to 300 units a month (APP, 2020). The lesson is plain. A defined national need, an engineering institution able to produce, and a temporary fast-track route for testing and approval delivered results within months.

Recent activity suggests that this interest persists. In May 2026, a medical device manufacturing summit in Karachi, organized by the Saman-e-Shifa Foundation with Salim Habib University and the Drug Regulatory Authority of Pakistan (DRAP), unveiled a "Vision 2030" target: local manufacture of at least 30 percent of the country's medical device needs by 2030. Participants resolved to create a Rs 1 billion research and development fund and inaugurated a Centre of Medical Device Innovation and Research. They also donated locally made ICU ventilators, multiparameter patient monitors and syringe pumps to the National Institute of Cardiovascular Diseases (Bhatti, 2026b). A coalition of industry, academia and the regulator set this target, not an approved government policy. It therefore carries no public funding or procurement commitments yet.

Industrial foundations already exist. Sialkot's surgical instruments cluster is an established exporter, with exports of about US$400 million according to one importer quoted in 2020 (Jamal, 2020). During the pandemic, local firms built enough capacity in personal protective equipment to attract orders from the United States and the European Union (Jamal, 2020). On the software front, the National AI Policy 2025 promises an AI Innovation Fund and an AI Venture Fund, specialised AI centres, 3,000 scholarships a year and support for 1,000 research projects. It also targets one million trained AI professionals by 2030 and backs locally built AI tools, including a national large language model (APP, 2025). Health AI trained on Pakistani data, in Urdu and regional languages, fits these funds naturally.

3.3 Challenges

The obstacles are serious. Most are institutional, not technical.

Financing comes first. Public health spending sits at 0.8 percent of GDP, and the development portfolio cannot finish projects already approved (Finance Division, 2026), so technology investments compete head-on with salaries, medicines and basic infrastructure. Digital health also suffers from a project mentality. Donors or start-ups fund a pilot; with no recurring public budget line behind it, the pilot fades.

Regulation poses the second problem, and it cuts both ways. Pakistan needs strong device regulation to protect patients, but it built its current system on a pharmaceutical template. In 2020, manufacturers complained that the Medical Devices Rules 2017 forced device makers to hire qualified pharmacists as production and quality control heads. The rules also treated each product variant as a separate registration and could expose firms to criminal penalties for making low-risk items, such as protective gowns, without full compliance. According to the same manufacturers, DRAP's medical devices division had only three staff, compared with around 500 in Malaysia, and just 15 companies had registered under the rules by then (Jamal, 2020). Interested parties made these claims. Still, they expose a real problem: a regulator without capacity chokes domestic producers as surely as it slows importers.

Uncertainty persists. In 2026, a DRAP notification allowed the import of refurbished devices but left the status of used equipment unclear, and importers warned of disruption. Their association claims that nearly 90 percent of the private sector relies on imported second-hand equipment (Express Tribune, 2026). Though only an industry estimate, the figure shows how heavily the system leans on foreign hardware, much of it old. It also reveals how fragile access becomes when rules change without consultation. Software adds a further layer. Legal analysts note that the approval pathway for software as a medical device, which would cover most diagnostic AI, remains unclear (Iqbal, 2024).

A legal vacuum around data forms the third challenge. Pakistan has enacted no personal data protection law. The draft Personal Data Protection Bill 2023 has completed consultation but has not passed both houses of Parliament; an AI regulation bill introduced in the Senate in 2024

remains pending; and no statutory framework governs the use of personal data for research and development (Khan & Khan, 2026). Telemedicine regulation is equally patchy. Sindh's Telemedicine and Telehealth Act 2021 requires practitioners to complete training and register before offering remote care. No federal equivalent exists, and the federal structure forces digital health providers to navigate several regulatory regimes at once (Iqbal, 2024). Patients, as a result, have weak protection for sensitive health information. Developers face legal risk and doubt over whether they may lawfully use clinical data to train and validate their tools.

People make up the fourth challenge, and not only doctors. Specialized technology needs biomedical and clinical engineers to install, calibrate and repair it, health informaticians to manage data, and clinicians at ease with digital tools. Even the best-resourced public specialist network employs just 30 engineers across 21 cancer hospitals (Finance Division, 2026). Add the steady emigration of doctors (Bhatti, 2026a) and the many inactive women doctors (AFP, 2026), and technology deployed without a workforce strategy may simply sit unused.

An evidence gap completes the picture. Studies conducted elsewhere supply much of the case for health AI (Tahir et al., 2025), while telemedicine programmes in Pakistan seldom publish rigorous data on clinical outcomes or cost-effectiveness. Without local evidence, payers such as provincial health insurance schemes have little basis for deciding what to fund.

4. Policy Recommendations

These recommendations aim to work within Pakistan's fiscal limits and federal structure. Most will require the Ministry of National Health Services, Regulations and Coordination, the Ministry of Information Technology and Telecommunication, DRAP and provincial health departments to act in concert.

1. ***Create a ring-fenced financing window for specialized care technology:*** *Federal* and provincial development budgets should commit a dedicated, multi-year allocation to specialist telemedicine networks, diagnostic AI and locally made equipment. Funding should follow measurable outputs: consultations delivered, screening coverage and equipment uptime. Before launching new projects, governments should complete the technology components of those already in the pipeline. Budgets must also cover recurring costs, including connectivity, software licenses and maintenance, from the outset; otherwise, pilots collapse once donor money ends.
2. ***Rebuild medical device regulation around devices, not medicines:*** DRAP should revise its medical device framework to make it genuinely risk-proportionate, easing requirements for low-risk products and matching staffing qualifications to engineering rather than pharmacy. Its medical devices division needs far more technical staff and published service timelines. The emergency testing and approval route used for ventilators in 2020 should become a permanent fast track for locally made devices that meet recognized international standards.

DRAP should also publish a clear pathway for software as a medical device, AI included, and settle the status of refurbished and used equipment through open consultation with hospitals, importers and manufacturers.

3. ***Use public procurement to anchor local manufacturing:*** Government hospitals buy more medical equipment than any other purchaser. Federal and provincial procurement rules should therefore reserve a gradually rising share of purchases for registered, quality-certified local devices. Mid-complexity products that Pakistani firms already make, such as patient monitors, syringe pumps and ventilators, offer the obvious starting point. Contracts should oblige suppliers to provide local maintenance and spare parts. Finally, the government should formally adopt a version of the 30 percent local manufacturing target proposed in 2026, set interim milestones, and match the proposed research and development fund with public money.

4. ***Close the legal gaps on data, telemedicine and AI:*** Parliament should enact the Personal Data Protection Bill, treating health data as sensitive and creating an independent, adequately resourced data protection commission. Alongside it, federal and provincial governments should agree on a harmonized telemedicine framework, built on the Sindh Act, so that licensing, consent, prescribing and data security standards apply consistently nationwide. The law should also open a governed route for using de-identified clinical data in research and AI development. Without one, local innovation will either stall or proceed without safeguards.

5. ***Build public hub-and-spoke tele-specialist networks:*** Each province should connect district and tehsil hospitals, including Punjab's new district cardiac units and the atomic energy cancer hospitals, to tertiary teaching hospitals for scheduled specialist teleconsultations, tele-radiology and case conferences. Making teleconsultations reimbursable under the Sehat Sahulat Programme and provincial insurance schemes would let the model pay for itself over time. A simple licensing route should allow home-based women specialists and Pakistani specialists abroad to offer sessions. Part of the brain drain, and part of the inactive workforce, would then become usable capacity.

6. ***Validate before buying: a national health AI sandbox:*** Drawing on the National AI Policy's innovation funds and centres, the government should support a health AI sandbox, jointly overseen by DRAP and the health ministry, where tools undergo prospective testing on Pakistani patients before any public procurement. Diabetic retinopathy screening, linked to the national diabetes programme and registry, makes a sensible first case; tele-radiology triage and cancer screening support could follow. Published results would let insurers and provinces base purchasing decisions on evidence.

7. ***Invest in the people who make technology work*****:** The Higher Education Commission and provincial health departments should expand programmes in biomedical engineering,

clinical engineering and health informatics, and create sanctioned posts for these professionals in public hospitals. Every technology rollout should come with retention measures for specialists: flexible and part-remote work, safer workplaces and childcare. Digital tools cannot make up for a workforce that keeps leaving.

5. Conclusion

Two forms of dependence trap Pakistan's specialized healthcare: reliance on imported machines, and reliance on a medical workforce increasingly drawn abroad or out of practice. Technology alone will fix neither. Used deliberately, though, it can ease both. Telemedicine can reconnect thousands of idle and remote clinicians with patients who have never seen a specialist. Validated AI can take over screening tasks that would otherwise wait months for an ophthalmologist or radiologist. Connected records can give referrals real meaning. And a domestic medical device industry, building on the engineering talent that produced working ventilators within months in 2020, can shield the system from the next foreign exchange crisis.

Pilots and announcements alone will not deliver this. Success demands steady money and a regulator equipped to approve good products quickly. It needs laws that protect patient data while permitting responsible innovation, a public sector willing to buy what Pakistani firms make, and serious investment in the engineers and clinicians who keep technology running. The policy pieces already exist: a draft health policy that prioritizes digitization, a national AI policy and a digital health framework. What remains is to fund them, connect them and hold institutions accountable for results.

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