

Review Article

Innovative strategies to strengthen geriatric healthcare in India: bridging gaps through digital health and community-based interventions

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ABSTRACT

India is experiencing a demographic shift with a rapidly growing elderly population projected to reach 20% by 2050. However, geriatric healthcare remains underdeveloped and inadequately integrated within the public health system. This article explores the status of elderly healthcare in India, highlighting key gaps in infrastructure, trained human resources, and service delivery. The National Programme for Health Care of the Elderly (NPHCE), though well-intentioned, suffers from limited implementation, particularly in rural and remote areas. The article examines the potential of digital health technologies such as telemedicine, mobile health units, and smart health monitoring to enhance access and continuity of care. Community-based approaches, including home visits by frontline health workers and family caregiver training, are presented as practical strategies to strengthen geriatric care. In addition, the psychosocial needs of the elderly mental health, family support, and palliative care are addressed as integral components of healthy ageing. The paper concludes by recommending a multi-sectoral approach involving policy integration, public-private partnerships, and targeted capacity building. Bridging the gap in geriatric care is essential not only for health equity but also for achieving India's Sustainable Development Goals (SDGs), especially SDG 3, 9, and 17.

Keywords: Geriatric healthcare, Telemedicine, Ageing population, Community health, India

INTRODUCTION

The Urgency of geriatric health in India

India is undergoing a significant demographic shift characterised by a steadily increasing elderly population. According to Census 2011, individuals aged 60 years and above constituted 8.6% of the total population, a figure projected to rise to 20% by 2050.¹ This transition is primarily driven by improvements in life expectancy and a decline in fertility rates. However, this demographic dividend comes with profound challenges, particularly in public health and healthcare service delivery.

India's ageing demographic and disease burden

The elderly population is highly vulnerable to non-communicable diseases (NCDs), mental health disorders, and age-related disabilities. Data from the Longitudinal Ageing Study in India (LASI) reveals that over 70% of elderly individuals suffer from at least one chronic disease, with hypertension (32%), diabetes (14%), and arthritis (18%) being the most common.² Additionally, functional limitations, such as reduced mobility and difficulty performing daily activities, are prevalent, especially among rural elderly and women.

Mental health among the elderly is an equally critical concern. Depression, anxiety, dementia, and social isolation remain underdiagnosed and undertreated, particularly in rural settings. A study conducted in rural Tamil Nadu reported that 31% of older adults suffered from clinically significant depressive symptoms, yet few received appropriate care.³

Epidemiological transition and public health implications

India's health profile has transitioned from a high burden of infectious diseases to chronic conditions. This epidemiological shift disproportionately affects the elderly, as they often require long-term management, rehabilitation, and coordinated care. Unlike acute infections, chronic illnesses need continuous medical follow-up, medication adherence, and supportive services such as physiotherapy and mental health support—all areas where the Indian healthcare system is still evolving.

Despite the growing needs, geriatrics remains under-prioritised in public health policy and planning. Most health programs are still focused on maternal and child health, communicable diseases, and family planning. Geriatric care services are fragmented, urban-centric, and inaccessible to rural and socio-economically disadvantaged populations.⁴ The National Programme for Health Care of the Elderly (NPHCE), launched in 2010, aimed to address these gaps but faces challenges in implementation and scale-up.

Need for a targeted public health approach

Given the demographic and epidemiological realities, India urgently needs a targeted and sustainable public health strategy for elderly care. This strategy must be inclusive of both preventive and promotive health services, integration of geriatrics in primary healthcare, and effective utilisation of digital health technologies to bridge access gaps, especially in rural and remote areas. As ageing intersects with socio-economic vulnerabilities, a life-course approach to healthcare, with special attention to geriatric needs, is critical for achieving equity and universality in healthcare delivery.

STATUS OF GERIATRIC HEALTHCARE INFRASTRUCTURE IN INDIA

India's approach to geriatric healthcare remains underdeveloped and fragmented despite the growing needs of its ageing population. While the government has initiated efforts such as the National Programme for Health Care of the Elderly (NPHCE), implementation challenges, human resource constraints, and disparities in infrastructure continue to hinder comprehensive service delivery. This section examines the current public healthcare response to ageing, focusing on structural programs, workforce deficits, and geographical disparities.

National programme for health care of the elderly (NPHCE)

Launched in 2010, the NPHCE is the cornerstone of India's national response to geriatric health needs. It aims to provide dedicated healthcare services to the elderly at primary, secondary, and tertiary levels. The program supports: geriatric OPDs at PHCs and CHCs, dedicated 10-bedded geriatric wards at district hospitals, and regional geriatric centres (RGCs) in selected medical colleges.⁵ Despite these intentions, implementation is slow and uneven across states. As of 2021, only 104 districts had functional geriatric units, and many primary care centres lack even basic infrastructure or trained personnel to meet the program's requirements.⁶ Rural areas are particularly affected, where logistical barriers, low awareness, and inadequate resources impede access. Moreover, monitoring and reporting mechanisms under NPHCE remain weak, limiting the ability to assess effectiveness or outcomes.

Shortage of geriatric professionals

India faces a severe shortage of trained geriatricians, a problem rooted in both education and workforce planning. Geriatrics is not a mandatory component in undergraduate medical education, and only a few institutions offer postgraduate or fellowship training in this specialty. According to estimates from the Indian Academy of Geriatrics, the country has fewer than 300 trained geriatricians, an alarmingly low number relative to the population size.⁷

Consequently, the burden of elderly care falls on general physicians, who often lack the knowledge and tools to address age-specific issues like polypharmacy, dementia, falls, and palliative care. Furthermore, there is no structured continuing medical education (CME) program in geriatrics for in-service healthcare providers. This lack of specialised training results in missed diagnoses, inappropriate prescriptions, and poor chronic disease management among elderly patients.

Urban–rural disparities

Healthcare access for the elderly is significantly skewed toward urban centres. Urban elderly often have better access to hospitals, specialists, diagnostics, and private care options. Conversely, rural elders face multiple barriers: scarcity of healthcare facilities, dependence on informal or unqualified providers and high out-of-pocket costs for transport and medication.⁸

Even when public facilities are present, they are often understaffed and ill-equipped for geriatric services. Lack of mobility, illiteracy, and social exclusion further aggravate these inequities. A 2020 study from rural Rajasthan found that only 12% of elders received regular blood pressure or glucose monitoring, despite being diagnosed with NCDs.⁹

These disparities also affect mental healthcare, rehabilitation, and social care access, making rural elders particularly vulnerable to preventable health deterioration. Bridging this gap requires not only physical infrastructure but also targeted outreach, capacity-building, and integration of community-based approaches.

DIGITAL HEALTH TECHNOLOGIES IN GERIATRIC CARE

Digital health has emerged as a transformative force in healthcare delivery, especially in countries with large rural populations and health infrastructure deficits like India. For geriatric care, where mobility issues, chronic conditions, and the need for continuous monitoring are common, digital technologies offer unique opportunities to bridge existing service gaps. This section explores key innovations—telemedicine, mobile health units, and smart monitoring devices and their role in improving access, quality, and efficiency in elderly healthcare delivery.

Telemedicine

Telemedicine provides remote clinical services using digital communication technologies, eliminating the need for physical travel, which is especially beneficial for older adults. India's flagship initiative, eSanjeevani, has facilitated over 100 million teleconsultations as of 2024, and a growing share of these users are elderly patients.¹⁰ It provides both doctor-to-doctor (eSanjeevaniAB-HWC) and doctor-to-patient (eSanjeevaniOPD) consultations, enhancing service delivery in underserved areas. Telemedicine improves: continuity of care for chronic diseases like hypertension, diabetes, and COPD, access to specialist advice in remote or rural settings, and reduced travel costs and physical stress for the elderly.

However, challenges include digital literacy, language barriers, and limited access to smartphones/internet among older populations. Training family members and caregivers as digital mediators may help address this digital divide.¹¹

Mobile health units

Mobile health units (MHUs) are vehicle-based clinics equipped with diagnostic tools, medications, and basic laboratory testing facilities. They are particularly effective in reaching bedridden or isolated elderly in tribal and remote locations. These units typically include a medical officer, pharmacist, lab technician, and ANM, and are often supported by state governments or NGOs. Several states have successfully integrated MHUs into their health systems such as Andhra Pradesh and Karnataka deploy MHUs for elderly screening under NPHCE. Tamil Nadu uses MHUs for NCD control and elderly outreach in hill and forest regions.¹² These units contribute to - early detection of diseases like hypertension and cataracts, routine health check-ups and

medicine distribution, referral services to nearby health facilities when needed. Despite their promise, challenges include maintenance issues, irregular schedules, and staffing shortages in difficult terrains.

Smart monitoring devices

The rise of affordable, easy-to-use smart health devices has opened new frontiers in home-based elderly care. Devices such as digital blood pressure monitors, glucose meters, pulse oximeters, wearable fall detectors and emergency alert buttons, allow real-time health monitoring, reduce hospital admissions, and enable timely intervention. Integration of such devices into remote patient monitoring (RPM) systems allows healthcare providers to track high-risk elderly patients and intervene proactively.

Pilot programs in India, such as those led by AIIMS Delhi and NITI Aayog's health innovation hub, have shown that smart devices can reduce emergency admissions and improve compliance with chronic disease management among the elderly.¹³ However, adoption remains low in rural areas due to cost, lack of awareness, and training barriers.

INTEGRATING GERIATRIC CARE INTO COMMUNITY HEALTH SYSTEMS

While tertiary and urban health systems are slowly adopting geriatric services, the real challenge lies in ensuring elderly care is available, accessible, and acceptable at the community level. Given that nearly 70% of India's elderly population resides in rural areas, the integration of geriatric services into primary healthcare is both a strategic and essential approach.¹⁴ This section highlights community health worker training, service delivery at PHCs/CHCs, and models of home-based elderly care that leverage existing public health infrastructure.

Training primary healthcare providers

India's primary healthcare system, composed of ASHAs (Accredited Social Health Activists), ANMs (Auxiliary Nurse Midwives), and MPWs (Multi-Purpose Workers), is the first point of contact for most rural elderly. However, these workers traditionally focus on maternal and child health, with limited training on geriatric care. Training community health workers in age-specific screening for conditions like hypertension, diabetes, visual and hearing impairment, recognising early signs of dementia, depression, and falls, nutritional counselling, physical activity guidance and medication adherence, has shown to improve elderly health outcomes and increase timely referrals.¹⁵ Pilot programs in Kerala and Gujarat have incorporated such modules with measurable success in chronic disease management among elderly populations.

Elderly health services at PHCs/CHCs

The NPHCE aims to establish dedicated geriatric OPDs at the Primary Health Centre (PHC) and Community Health Centre (CHC) levels. These clinics are designed to provide regular check-ups and screening for common NCDs, dispensation of essential medicines, physiotherapy and rehabilitation support through trained staff. However, many PHCs lack basic infrastructure or separate space for elderly care. In states like Himachal Pradesh and Odisha, some CHCs have integrated elderly services with NCD clinics to optimise resource use.¹⁶ The Health and Wellness Centres (HWCs) under the Ayushman Bharat initiative also provide a platform to integrate geriatric services into routine primary care by expanding service packages and staff training.

Home-based care models

As life expectancy increases, so does the proportion of home-bound elderly require daily assistance, especially in cases of stroke, severe arthritis, or cognitive decline. Home-based geriatric care, when delivered by Community Health Officers (CHOs) or trained ANMs, can reduce hospital admissions, prevent complications from chronic diseases, improve emotional and mental well-being of seniors through regular interaction.

The Home-Based Elderly Care (HBEC) model piloted in Maharashtra and parts of Karnataka showed that bi-weekly visits by health workers led to increased medication adherence and reduced emergency referrals among the elderly.¹⁷ Integration of such models into national programs is vital to making community-level geriatric care scalable and sustainable.

SOCIAL AND MENTAL HEALTH NEEDS OF THE ELDERLY

In addition to physical health, elderly well-being is deeply influenced by psychosocial factors, including loneliness, family dynamics, and end-of-life preparedness. Despite high rates of mental health conditions and social vulnerability, geriatric psychosocial care remains underemphasised in India's public health framework. This section discusses three core domains of concern: mental health and loneliness, family and community support, and the emerging need for palliative and end-of-life care.

Mental health and loneliness

Mental health disorders are common but underdiagnosed in India's elderly population. Depression, anxiety, cognitive impairment, and dementia are prevalent, yet most elderly individuals do not receive appropriate diagnosis or treatment. According to the Longitudinal Ageing Study in India (LASI), approximately 34% of adults aged 60+ reported depressive symptoms, and only 9% had ever consulted a mental health professional.¹⁸

Key contributing factors include social isolation following retirement, widowhood, or children's migration, stigma surrounding mental illness, limited availability of psychiatric care in rural areas.

Community-based mental health models have shown potential. Initiatives like Elderline, a national helpline for senior citizens, offer counselling and referral support. Additionally, states like Kerala and Sikkim have piloted community counselling sessions for older adults, which have been linked to improvements in mood, sleep, and quality of life.¹⁹

Role of family and community support

In Indian society, the family traditionally serves as the primary caregiver for the elderly. However, with increasing nuclearisation and migration, this support system is weakening. As a result, elderly individuals face neglect or inadequate care, financial dependence and lack of decision-making power, psychological distress from feelings of being a burden.

Evidence shows that intergenerational engagement, such as regular visits, shared activities, or inclusion in household decision-making, improves emotional well-being and reduces dependency.²⁰ Community efforts like forming senior citizen clubs, self-help groups, or day-care centres for the elderly (run by NGOs or gram panchayats) can help rebuild social networks, especially in rural areas.

Training family members in basic elder care-including hygiene, mobility assistance, and medication routines-can ease the burden on formal systems and improve care quality. These low-cost, community-supported models align well with India's decentralised public health vision.

Palliative and end-of-life care

Palliative care, essential for those with advanced NCDs, dementia, or terminal illnesses, remains largely unavailable in India's public healthcare settings. According to a 2015 study, less than 1% of India's population has access to structured palliative care services.²¹

End-of-life care for the elderly is often medicalised in urban hospitals or entirely absent in rural homes. Without formal support, elderly patients face unrelieved pain, emotional distress, and lack of dignity in dying. The need for ethical, compassionate, and culturally sensitive palliative care is critical in an ageing society.

To address these gaps, India must train CHWs and primary care physicians in basic palliative care protocols (pain management, communication skills, spiritual care), integrate palliative services into existing frameworks like Health and Wellness Centres (HWCs), encourage home-based palliative care models supported by NGOs and

district hospitals, develop end-of-life care policies and guidelines that uphold patient dignity and family support.

Models from Kerala's Neighbourhood Network in Palliative Care (NNPC) demonstrate the feasibility of community-led palliative programs, using trained volunteers and local health staff to provide dignified care at the end of life.²²

ROLE OF PARTNERSHIPS AND PUBLIC HEALTH INNOVATION

Strengthening geriatric healthcare in India demands not only governmental effort but also the active participation of non-governmental organisations (NGOs), academic institutions, private healthcare players, and technological innovators. Multi-sectoral collaboration, backed by innovation in service delivery, can drive scalable, sustainable, and inclusive models of care. This section explores the significance of public-private partnerships (PPPs), pilot models, and the role of academic institutions in advancing elderly care in India.

Public-private partnerships (PPP)

Public-private partnerships in elderly care are increasingly recognised as efficient mechanisms for expanding service outreach, especially in low-resource and rural settings. Through such collaborations-technology companies can provide telehealth platforms and diagnostic tools. NGOs can offer on-ground implementation, training, and community mobilisation. Government agencies can fund, regulate, and integrate services into national programs.

For example, HelpAge India collaborates with state governments to run Mobile Health Units (MHUs) that provide free check-ups, medicines, and referrals to older adults in over 15 states.²³ These models demonstrate how pooling resources and expertise improves access and quality of care for the elderly.

Pilot models and case studies

Several innovative models across India provide valuable insights into elderly care integration such as Karuna Trust Model (Karnataka and Arunachal Pradesh)-A public-private initiative delivering primary care through PHCs managed by NGOs. Services include home visits, NCD screening, and elder health counselling. Reports show improved medication adherence and better monitoring of elderly patients with chronic diseases.²⁴

HelpAge India's MHU Program which has been serving over 300,000 older adults annually, these mobile clinics are designed specifically for geriatric needs, including orthopaedic consultations, cataract identification, and palliative services. Data from Rajasthan and Bihar show high community satisfaction and increased early detection of health issues.²⁵

Healthy Ageing Project (Uttarakhand) conducted in collaboration with AIIMS Rishikesh, this pilot used digital health cards, elderly-specific screening camps, and home-care teams. Preliminary results indicated a 40% increase in follow-up visits and better control of hypertension and diabetes among elderly participants.²⁶

These pilots provide evidence for scalable and replicable interventions that are cost-effective and culturally sensitive.

Government and academic involvement

Academic institutions and medical colleges have a crucial role in training the next generation of doctors and nurses in geriatric medicine, conducting research on ageing, care models, and digital health tools, supporting the development of low-cost assistive devices and technology.

The National Institute of Mental Health and Neurosciences (NIMHANS) has developed community geriatric mental health modules, while AIIMS Delhi runs a Regional Geriatric Centre that offers fellowships in geriatric medicine.²⁷

Governmental think tanks such as NITI Aayog and bodies like the Indian Council of Medical Research (ICMR) are also facilitating innovation through funding pilot studies, supporting telehealth platforms, and promoting digital health adoption under the Ayushman Bharat Digital Mission (ABDM).

Together, these efforts highlight the importance of collaborative governance and knowledge-sharing in delivering elder-friendly health services at scale.

CHALLENGES AND FUTURE RECOMMENDATIONS

Despite policy-level acknowledgement and emerging digital and community-based innovations, the journey toward equitable geriatric care in India is far from complete. Persistent barriers such as digital exclusion, human resource gaps, and fragmented program implementation continue to affect service delivery. This section outlines the key challenges and presents strategic recommendations to guide future action toward inclusive and resilient elderly healthcare systems.

Barriers to adoption of digital solutions

Digital technologies such as telemedicine and wearable health monitors have shown promise, but their adoption among the elderly faces multiple constraints such as low digital literacy among older adults, especially in rural and semi-literate populations. Limited access to smartphones, stable internet, and electricity in remote areas. Technological reluctance due to cognitive or sensory limitations.

A study in rural Tamil Nadu found that only 27% of elderly individuals were comfortable using mobile phones for health communication, and less than 10% had engaged in teleconsultations independently.²⁸

Addressing these barriers requires digital health literacy campaigns tailored for older adults, engaging family caregivers and community health workers as intermediaries, provision of user-friendly devices with voice, vernacular, and visual interfaces.

Capacity building and human resources

India faces a severe shortage of trained geriatric professionals, including doctors, nurses, physiotherapists, and counsellors. According to the Medical Council of India, fewer than 20 medical colleges offer a dedicated MD or fellowship in geriatrics.²⁹

Urgent actions include: introducing mandatory geriatrics modules in undergraduate medical and nursing curricula, expanding postgraduate and fellowship programs in geriatric medicine at district hospitals and regional centres, providing in-service training and refresher courses for existing PHC staff. Capacity building must extend beyond physicians to include community health workers, caregivers, and auxiliary personnel involved in elderly care.

Policy and programmatic integration

Although India has launched several programs such as NPHCE and Ayushman Bharat, elderly care often remains siloed, poorly funded, and inconsistently implemented across states.

To ensure programmatic coherence, geriatric services must be mainstreamed into Health and Wellness Centres (HWCs) under Ayushman Bharat. State governments should adopt standardised elderly care guidelines and allocate dedicated budgets for geriatric components. Use of electronic health records (EHRs) and digital tracking systems should be encouraged for chronic disease monitoring, medication management, and follow-up visits.

Additionally, inter-ministerial coordination between the Ministry of Health and Family Welfare, Ministry of Social Justice and Empowerment, and Ministry of Rural Development is essential to address the multidimensional needs of the elderly-health, nutrition, housing, and social protection.

CONCLUSION

The evolving demographic profile of India necessitates a robust and inclusive response to geriatric health needs. While innovations in digital health, community engagement, and public-private partnerships show promise, these must be accompanied by systemic

changes-training, policy integration, funding, and culturally appropriate service delivery models. Prioritising the elderly in public health discourse is not merely a moral imperative but a strategic investment in the health and resilience of the nation.

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