Partnership for Health System Sustainability and Resilience

JAPAN

Policy roadmaps for acting early on NCDs

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AI	Artificial Intelligence
AMED	Japan Agency for Medical Research and Development
ATACH	Alliance for Transformative Action on Climate and Health
BCP	Business Continuity Plan
CAPRI	Center for Asia-Pacific Resilience and Innovation
CKD	Chronic Kidney Disease
COPD	Chronic Obstructive Pulmonary Disease
DALY	Disability-Adjusted Life Year
DX	Digital Transformation
EMR	Electronic Medical Record
GBD	Global Burden of Disease
GHG	Greenhouse Gas
JCTN	Japanese Cancer Trial Network
MHLW	Ministry of Health, Labour and Welfare
Minds	Quality Health Care's Medical Information Distribution Service
Multi-CDx	Multi-Companion Diagnostics
NCD	Non-Communicable Disease
NDB	National Database of Health Insurance Claims and Specific Health Checkups of Japan
NHS	National Health Service
OECD	Organization for Economic Co-operation and Development
OOP	Out-of-pocket (expenditure)
PHSSR	Partnership for Health System Sustainability and Resilience
QI	Quality Indicator
SaMD	Software as a Medical Device
UHC	Universal Health Coverage
WHO	World Health Organization

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Titles omitted for brevity. Listed in alphabetical order by surname within each domain.

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Introduction

This report presents Japan's contribution to the Partnership for Health System Sustainability and Resilience (PHSSR) Policy Roadmaps for Acting Early on Non-Communicable Diseases. As the first in a series covering eight countries, it explores how health systems designed for episodic, acute care can adapt to the reality of chronic diseases.

Japan leads the world in life expectancy, yet on average, people spend about a decade of their lives – 9.9 years for men and 12.7 for women – living with illness. Non-communicable diseases account for 87.1% of deaths, affecting millions, managing daily pain, losing independence, and being unable to work or participate fully in society. The burden extends beyond individuals to families navigating fragmented care systems and communities facing rising healthcare costs. This gap between longevity and health highlights both a humanitarian imperative and an economic necessity for reform.

PHSSR – a collaboration between AstraZeneca, the London School of Economics and Political Science (LSE), Marsh, Roche Diagnostics, Royal Philips, the World Economic Forum, the Centre for Asia-Pacific Resilience & Innovation (CAPRI), IQVIA and the WHO Foundation – recognises that incremental improvements are not enough. Health systems worldwide need fundamental reform: shifting from reactive to preventive, from fragmented to integrated, from volume-based to value-based. This report assesses Japan's current system performance and outlines evidence-based pathways for such change.

The analysis focuses on cardiovascular, renal, and metabolic diseases; cancers; and chronic respiratory diseases – conditions that share risk factors, frequently co-occur, and account for around 80% of premature NCD deaths. These diseases often develop over decades, providing multiple opportunities for prevention and early intervention. While NCDs include a broader range, such as mental health and musculoskeletal conditions, the principles and strategies discussed here – prevention, early detection, integrated care – apply across all chronic diseases.

Our methodology uses a structured framework to analyse seven key areas of health system performance. Population health analysis highlights disease trends and potential intervention points. Governance assessment reviews policy formulation and implementation processes. Service delivery evaluation detects discrepancies between optimal practices and actual care. Financing review investigates how payment models and incentives influence behaviours within the health system. Workforce analysis tackles human resource issues. Medicines and technology assessment focuses on access to innovations. Environmental sustainability examines the connection between health systems and climate change. For each area, we measure current performance with established indicators, identify measurement gaps, and offer targeted recommendations for improvement.

Japan possesses notable strengths that lay a foundation for transformation. Universal health coverage guarantees basic access. Extensive screening programmes reach millions every year. World-leading diagnostic technology allows for early detection. A strong prevention culture supports public health measures. However, ongoing challenges restrict the system's effectiveness: coordination among providers remains fragmented, digital adoption trails behind international standards, regional disparities in access continue, and payment systems often favour quantity over quality. This analysis explores how existing assets can be better aligned and how current barriers can be systematically overcome.

The methodology leverages Japan's extensive health databases, international comparative data, and expert consultation across various sectors. Domain-specific advisory committees – including medical professionals, patient representatives, and policy experts – reviewed the findings to ensure both technical rigour and practical relevance. This multi-stakeholder approach reflects the reality that health system transformation requires engagement beyond traditional healthcare boundaries.

The timing of this analysis is vital. The World Expo 2025 in Osaka and the UN High-Level Meeting on NCDs in September 2025 will generate global momentum for reform. Domestically, as Japan's baby boomer generation ages into seniors and healthcare spending reaches 46.7 trillion yen annually, the

sustainability challenge becomes more urgent. Recent policy initiatives, such as Health Japan 21 (Third Term) and the Medical DX Reiwa Vision 2030, indicate readiness for change, but their implementation remains fragmented.

This report offers policymakers, healthcare leaders, and stakeholders a thorough assessment and practical advice. Instead of relying on theoretical frameworks, we provide specific, actionable recommendations based on evidence and tested through international comparison. By analysing what works, recognising what doesn't, and suggesting concrete solutions, we aim to support a healthcare system that not only prolongs life but also ensures that people can live those years with dignity, purpose, and vitality. The aim is clear: to guarantee that Japan's impressive longevity is accompanied by sustained health and quality of life for everyone.

Methodology and stakeholders consulted

The research methodology was structured around three primary components: a systematic literature review, targeted expert engagement and consultation, and a validation process. This entire approach was underpinned by the PHSSR framework, developed by LSE to support policy roadmaps for early intervention on Non-Communicable Diseases (NCDs). This framework defines key measures of country performance across seven essential domains: Population Health, Governance, Service Delivery, Financing, Workforce, Medicines and Technology, and Environmental Sustainability.

The analysis commenced with a desk research phase, which began with a review of foundational documents, serving as the starting point for the investigation. Targeted literature searches were performed, including both academic and grey literature. This iterative process included targeted searches to identify existing policies, initiatives, and gaps across the research domains.

To complement the literature review and ensure the final report was grounded in local expertise, stakeholder consultations were organised to gather feedback on preliminary findings and recommendations. The list of stakeholders consulted is found in the acknowledgement section. This iterative process began with consultations with key external experts, policymakers, opinion leaders, and patient organisations representing all in-scope NCD areas. The objective was to identify gaps in the report, reinforce areas of agreement, and identify areas of disagreement requiring further research. After each consultation round, new information was integrated, and recommendations were refined, ensuring the final report reflects the latest evidence and stakeholder input.

Finally, a review of existing and potentially relevant indicators was developed based on the key issues identified in each domain. These indicators were selected for their relevance to assessing the performance, sustainability, and resilience of NCD prevention and early-diagnosis strategies. Selection criteria emphasised specificity to the topic, feasibility of data collection, and suitability for both longitudinal and international comparisons. Indicators most relevant to each domain were identified by LSE, then reviewed and interpreted by the local research team, and synthesised in each section to reflect local insights.

Executive summary

The challenge of healthy longevity

Japan's success in extending life expectancy is well documented. What receives less attention is that the additional years are not always healthy ones. According to Global Burden of Disease estimates, Japanese men now spend 9.9 years and women 12.7 years living with illness or disability. These gaps between life expectancy and healthy life expectancy have widened since 1990. Non-communicable diseases account for 87.1% of deaths, and for millions of people this means not a single acute event but years of managing chronic conditions, with consequences for independence, capacity to work, and quality of life.

A substantial portion of this burden is, in principle, preventable. Over 40% of Japan's NCD-related disability-adjusted life years stem from metabolic and behavioural risk factors amenable to intervention. The conditions examined in this report (cardiovascular, renal, and metabolic diseases; cancers; and chronic respiratory diseases) share a common feature: they typically develop over years or decades, creating multiple windows for prevention, early detection, and treatment before disease becomes severe or irreversible.

The central question this report addresses is whether Japan's health system is organised to exploit these windows, and where it falls short, what changes would enable earlier action across the full spectrum from prevention through to treatment.

The economic and demographic context

These questions carry increasing urgency. National medical expenditure rose from approximately ¥39.2 trillion in 2012 to ¥46.7 trillion in 2022, driven substantially by population ageing. At 11.5% of GDP, Japan's healthcare spending now exceeds the OECD average of 9.2%. These pressures will only intensify as the baby boomer generation ages further.

The evidence suggests that earlier intervention can make a difference. Age-standardised NCD mortality has fallen 20.5% since 2000. Where Japan has invested in systematic screening and treatment, notably for gastric cancer, outcomes have improved substantially. But the pace of progress is slowing: annual reductions in age-standardised DALYs fell from -1.04% during 1990–2000 to -0.64% in the two decades following. For some conditions, particularly diabetes, the trajectory has reversed and outcomes have worsened. Current approaches appear to be reaching their limits.

This report examines seven domains of health system performance to identify where existing arrangements support early action, where they impede it, and what reforms might help the system act earlier across the disease trajectory.

DOMAIN 1: POPULATION HEALTH

Japan leads the world in both life expectancy and healthy life expectancy, supported by longstanding initiatives including Health Japan 21. Yet the gap between these measures, representing time spent in poor health, has widened over recent decades. While age-standardised NCD DALYs improved by 21.4% between 1990 and 2021, the rate of annual improvement halved after 2000, suggesting diminishing returns from current strategies.

Progress has also been uneven across conditions. Gastric cancer and ischaemic heart disease showed marked reductions in disease burden, while diabetes worsened by 21.9% and pancreatic cancer by 9.0% over the same three decades. The contrast is instructive: it demonstrates that well-designed, adequately resourced intervention can succeed, but also that current approaches are failing to reach some conditions and some populations.

Socioeconomic gradients in health outcomes remain steep. Analysis from 2010–2015 found mortality differences of up to 40% by educational attainment, alongside significant income-related variation in health behaviours. Prevention efforts that do not account for these disparities will tend to benefit those already advantaged. At the same time, key behavioural risk factors have proven stubbornly resistant to change: daily salt intake remains nearly double WHO recommendations, physical activity levels are low, and hypercholesterolemia is rising among women.

Environmental risks add further complexity. Heatstroke deaths increased roughly fivefold between 1995 and 2023, disproportionately affecting elderly people with underlying cardiovascular and metabolic conditions. As climate pressures mount, the intersection of environmental and chronic disease risks will demand closer attention.

Current policy frameworks, organised largely around single diseases, may also be poorly matched to clinical reality. Survey data suggest that over 80% of elderly residents in Tokyo have two or more chronic conditions. For these patients, the challenge lies not in managing one disease but in navigating the interactions among several, often without coordinated support.

RECOMMENDATIONS

1. **Establish comprehensive risk factor management:** The major modifiable contributors to disease burden (high blood glucose at 9.4% of DALYs, high blood pressure at 8.7%, and smoking at 8.3%) are currently addressed in isolation. Programmes tackling metabolic risk factors in combination, and smoking interventions integrating behavioural approaches with fiscal measures such as tobacco taxation and insurer-level incentive schemes, would enable earlier action before individual risks compound into established disease.

2. **Target prevention to reduce health disparities:** Early intervention cannot succeed if it fails to reach those at highest risk. With mortality disparities of up to 40% by educational background, prevention strategies must address the specific populations where socioeconomic factors concentrate poor outcomes. This includes strengthening outreach through workplace screening for those in non-regular employment, enhancing National Health Insurance prevention programmes for self-employed and unemployed populations, and ensuring that insurer-based health promotion initiatives do not widen gaps between Employee Health Insurance and National Health Insurance enrollees.

3. **Strengthen primary prevention through inter-sectoral action:** Effective prevention requires collaboration beyond the health sector. The involvement of the Cabinet Office and Ministry of Economy, Trade and Industry in NCD governance reflects recognition of this, but implementation remains fragmented. Implementing Health in All Policies approaches, linking healthy behaviour incentives to screening participation, and coordinating across ministries on initiatives spanning the life course would address the upstream determinants that shape NCD risk.

4. **Develop environmental health responses:** The fivefold rise in heatstroke deaths since 1995, concentrated among elderly NCD patients whose cardiovascular and metabolic conditions heighten susceptibility to heat, signals growing climate-related health risks. Regional adaptation strategies focused on vulnerable populations, building on existing initiatives such as the nationwide Heatstroke Alert system, would allow the system to anticipate these impacts rather than merely react to them.

5. **Build integrated community care focused on wellbeing:** For patients with multimorbidity, the objective extends beyond treating discrete diseases to supporting social participation and quality of life. This means addressing the social determinants that accelerate disease progression (stigma, workplace exclusion, isolation) through approaches such as social prescribing. Japan has emerging models to build on, including Yabu City's "CONNECT DAY YABU" programme, which links digital self-assessment tools with community health nurses and specialists to provide personalised support and community connection.

DOMAIN 2: GOVERNANCE

Japan has built institutional structures for NCD governance: dedicated MHLW divisions for major conditions, expert bodies combining clinical, patient, and local government perspectives, and a two-tier system in which 47 prefectures develop healthcare plans while approximately 1,700 municipalities oversee community health services. This architecture balances national consistency with regional adaptation.

Effective early intervention, however, demands coordination that cuts across traditional boundaries: between ministries, levels of government, clinical specialties, and policy domains. Here the picture is less encouraging. The second Healthcare and Medical Strategy (2020–2024) exposed persistent difficulties in achieving coherence across ministries, despite recognition that NCD prevention spans health, economic, and social policy. Major academic societies focused on hypertension and diabetes lack permanent representation on the Health Japan 21 Promotion Expert Committee. Private sector expertise in behavioural intervention and food reformulation remains peripheral to core policy development, even though dialogue forums exist for specific issues such as the Study Group for Promoting a Sustainable Food Environment.

Data infrastructure illustrates a related tension between potential and practice. Japan has invested in comprehensive databases, including the NDB and National Cancer Registry, that could underpin evidence-based prevention. Yet access procedures can stretch beyond a year, rendering these assets less useful for timely policy development than they might be.

Governance structures also remain organised predominantly around individual diseases, which may not serve well the growing population managing multiple conditions simultaneously. The COVID-19 pandemic further exposed gaps in crisis preparedness affecting NCD patients, whose need for continuous care sits uneasily with systems geared toward acute response.

RECOMMENDATIONS

1. **Promote evidence-based policy through cross-ministerial coordination:** Acting early on NCDs requires aligned action across health, economic, and social policy, spanning prevention through to treatment and rehabilitation. The MHLW should restructure collaboration frameworks with relevant ministries to develop policy formulation and resource allocation systems built on shared evidence and unified indicators, allowing efforts to be planned coherently rather than fragmented across ministerial silos.

2. **Accelerate data access for policy development:** National databases represent major investments whose value depends on usability. Between 2018 and 2023, only 50 new uses of identifiable and anonymised National Cancer Registry information were reported, indicating underutilisation. Streamlining access to the NDB and Cancer Registry, shifting from "entry regulation" to "exit regulation" for data management, and establishing cloud-based analytical infrastructure would enable evidence to inform policy in relevant timeframes.

3. **Develop comprehensive evaluation frameworks:** Current indicators leave gaps. Chronic kidney disease is tracked mainly through dialysis initiation, when what is needed are indicators measuring patients maintained at earlier CKD stages (1–3) before progression to end-stage renal disease ; diabetes lacks robust measures for complication prevention. Evaluation systems spanning the full pathway should incorporate outcome-focused KPIs such as cancer stage shift targets (measuring earlier-stage detection rates), CKD progression indicators (tracking patients maintained at earlier stages), and avoidable emergency admissions for conditions like COPD. Such indicators would reveal earlier where interventions are working and where they are not.

4. **Broaden expertise and stakeholder involvement:** Prevention policy should draw on the full range of relevant knowledge. Expanding permanent participation on bodies such as the Health Japan 21 Promotion Expert Committee to include NCD-focused academic societies (including those

addressing hypertension and diabetes), strengthening collaboration with industry on behavioural and dietary interventions, and institutionalising patient involvement would improve both the quality and legitimacy of policy decisions.

5. **Promote NCD continuity through telehealth and digitisation:** Emergencies disrupt routine care, with particular consequences for patients dependent on ongoing treatment. The COVID-19 pandemic led to postponed cancer surgeries, interrupted chronic disease check-ups, and restricted rehabilitation services. Systems ensuring continuity through expanded online consultation (currently offered by only 18,121 of 113,352 medical institutions), enhanced information sharing, and institutional digitalisation would protect gains from early detection and treatment from being undone by crisis-related interruptions.

DOMAIN 3: SERVICE DELIVERY

Japan's universal health insurance system, in place since 1961, provides broad access to care without gatekeeping. Clinical infrastructure is extensive: some 450 guidelines are available through the Japan Council for Quality Health Care, and Japan leads OECD countries in density of CT, MRI, and PET scanners.

Whether this infrastructure translates into timely detection and treatment is a different question. Specific Health Checkup participation reached 58.1% in 2022, a figure that masks 20–30 percentage point variation across prefectures. Cancer screening rates for several conditions fall short of OECD averages. And despite screening availability, late-stage diagnosis remains common for some cancers: 56.6% of lung cancers and 47.3% of colorectal cancers are detected at advanced stages. The distance between screening infrastructure and early detection outcomes suggests that availability alone does not guarantee timely diagnosis.

Several factors may contribute. Health data retention is limited to five years under current arrangements, constraining both longitudinal patient management and research. Over 80% of local authorities conduct screenings that deviate from national guidelines, raising questions about consistency. Care pathways between screening and treatment are not always clearly defined: referral criteria vary across institutions, and follow-up rates for patients requiring further investigation remain below target.

For patients with multiple conditions, these challenges compound. Multimorbidity guidelines exist for some diseases but not others. There is no national system for monitoring guideline adherence. Care coordination mechanisms for complex patients remain underdeveloped.

RECOMMENDATIONS

1. **Enhance screening participation and follow-up:** Screening infrastructure achieves little without uptake and follow-through. The 20–30 percentage point variation in Specific Health Checkup participation across prefectures suggests scope for learning from higher-performing regions and tailoring approaches to local circumstances. Individualised interventions addressing the specific circumstances of non-attenders, informed by behavioural insights, would help convert availability into detection. Equally important is systematic follow-up ensuring that those flagged for further assessment actually receive it, with clear accountability for completion rates.

2. **Advance risk-based screening approaches:** Moving beyond uniform screening toward risk-stratified approaches could improve both efficiency and outcomes. Japan's cancer genome medicine advances have enabled personalised risk assessment for some conditions, including BRCA1/2 testing for breast cancer, but broader application remains limited. Research on new biomarkers and AI-based risk prediction such as polygenic risk scores, together with nationally standardised data collection and evaluation systems, would support more targeted early detection.

3. **Improve chronic disease control through guideline-concordant care:** Early intervention extends beyond identification of people at risk and timely diagnosis to ongoing management that forestalls progression. For hypertension and diabetes, care systems focused on improving control rates through better treatment adherence and lifestyle support would help prevent advancement to severe disease. The proportion of individuals continuing diabetes treatment increased only modestly from 63.7% in 2010 to 67.6% in 2019, suggesting room for more effective approaches. Establishing national systems to monitor guideline adherence across institutions would help identify variation and support quality improvement.

4. **Develop comprehensive approaches for multimorbidity:** Applying single-disease guidelines to patients with multiple conditions risks excessive or conflicting treatment and polypharmacy. While diabetes guidelines address common complications, this approach should be extended to other conditions. Clinical pathways accommodating individual circumstances, and systems supporting personalised care, would better serve this growing population.

5. **Align incentives with coordination and outcomes:** Early detection loses value if patients cannot move efficiently through diagnosis to treatment. Reimbursement structures rewarding coordination across providers, investment in primary care capacity to manage complexity, and outcome-focused evaluation would support more integrated care and reinforce adherence to evidence-based pathways.

6. **Create incentives for innovative medicines and digital solutions:** Telemedicine and digital tools can support earlier detection, while innovative medicines can facilitate better disease management, but adoption remains uneven. Reimbursement incentives promoting these solutions, alongside nationwide implementation of the National Medical Information Platform and standardised EMR systems, would help embed digital capability across the system.

7. **Build healthcare information infrastructure:** Longitudinal care requires longitudinal data. Current five-year retention limits constrain both individual health management and research. Extending retention, integrating platforms across insurers, and implementing the National Medical Information Platform for centralised sharing of health, medical, and nursing care data would enable the tracking and coordination on which acting early depends.

DOMAIN 4: FINANCING

How healthcare is financed shapes the incentives facing patients, providers, and insurers, and thus whether the system supports early action or defaults to treating established disease. Japan's expenditure reached 11.5% of GDP in 2022, above the OECD average, with NCDs consuming a large share: ¥6.17 trillion for cardiovascular disease and ¥4.97 trillion for neoplasms.

The economic case for acting early rests on analyses like a 2015 study estimating that modifiable cancer risk factors cost approximately ¥1.024 trillion. Yet translating this logic into resource allocation is hampered by the absence of systematic tracking of spending on prevention, screening, and early-stage treatment. Without visibility into what is spent on early action and what it achieves, evidence-based decisions about resource allocation remain difficult.

Current incentive structures tend to favour activity over outcomes. Insurer reward systems such as the Insurer Effort Support System emphasise process metrics such as health checkup rates rather than health improvements or early detection of disease. Provider reimbursement offers limited recognition for prevention, early diagnosis, or effective disease management, and outcome-linked payment remains underdeveloped.

Financial barriers also shape access unevenly. Although out-of-pocket (OOP) spending as a share of household consumption is below the OECD average, a 2023 survey found that 24.2% of cancer patients reported treatment costs affecting daily life, rising to 44.9% among young adults aged

18–39. For some populations, economic constraints may foreclose opportunities for prevention and early treatment.

RECOMMENDATIONS

1. **Track spending on early action:** Strategic investment requires knowing what is currently spent on prevention, screening, early diagnosis, and early-stage treatment, and with what effect. Japan's current tracking of national medical expenditure focuses on treatment costs under public health insurance, excluding most preventive services. Developing systems that comprehensively record spending across the full spectrum of early intervention would provide the evidence base for assessing whether resources flow toward timely action.

2. **Introduce outcome-based payment:** Current incentive systems, including the Insurer Effort Support System, emphasise participation metrics rather than health outcomes. Payment mechanisms rewarding disease control and complication prevention, drawing where appropriate on continuous monitoring through wearable devices, would better align financial signals with early intervention objectives.

3. **Pursue sustainable financing reform:** Resources for early action depend on overall system sustainability. With national medical expenditure rising from ¥39.2 trillion to ¥46.7 trillion over a decade, efficiency improvements including review of low-value services would help ensure funds are available for prevention, early detection, and effective disease management while appropriately balancing taxes, premiums, and OOP costs.

4. **Address financial barriers to access:** Early intervention cannot reach those priced out of participation. The 44.9% of young adult cancer patients reporting financial burdens affecting daily life, and the gradual increases in cost-sharing ratios over recent decades, suggest that economic obstacles are real for some groups. Strengthening support through mechanisms such as the High-Cost Medical Expense Benefit System, while ensuring that planned revisions do not create new barriers, would help prevent financial constraints from closing off opportunities for timely care.

DOMAIN 5: WORKFORCE

What services can be delivered, and where, depends fundamentally on workforce capacity and distribution. Japan's physician density of 2.6 per 1,000 population falls below the OECD average of 3.7, with nearly twofold variation across prefectures. National projections anticipate overall supply–demand balance by 2029, but regional and specialty imbalances are expected to persist.

Two workforce dimensions bear particularly on the capacity to act early. The first is primary care. General practice physicians, positioned to identify risk factors, detect early disease, and coordinate ongoing management, numbered just 311 in 2023. This is a thin foundation for the comprehensive, longitudinal care that an ageing, multimorbid population requires. Specialist training is well established; generalist capacity far less so.

The second is home and community care. Nursing numbers exceed OECD averages in aggregate, but projected shortfalls of 60,000–270,000 by 2025 will fall disproportionately on home nursing, precisely where much chronic disease management occurs. Urban areas face particular pressure.

Efforts to extend effective capacity through task shifting have made limited headway. The Specified Acts Training System has certified 11,840 nurses against a target of 100,000, and nearly a third of those trained report not applying their new competencies in practice. The gap points to barriers beyond training, to workplace systems and supports that remain underdeveloped. The government's "three-in-one reform" approach, combining optimisation of regional medical institution functions, improved working conditions, and measures to address distribution imbalances, represents integrated policy thinking, but effective implementation varies considerably across regions.

Regional workforce disparities translate directly into uneven access to preventive and specialist care. Redistribution initiatives have shown some success for younger physicians, but imbalances among experienced practitioners persist.

RECOMMENDATIONS

1. **Strengthen primary care:** Acting early rests heavily on generalist capacity to identify risks, detect disease, and manage conditions before they progress. With only 311 qualified general practice physicians registered in 2023, Japan's generalist foundation is thin relative to the needs of an ageing, multimorbid population. Expanding financial support for general practice training, developing NCD-focused multidisciplinary programmes, and enabling primary care physicians to access online specialist consultation would build the capacity that earlier action requires.

2. **Enhance workforce efficiency through digital tools:** Where workforce supply is constrained, technology can reduce burden and stretch capacity. AI-assisted documentation, information-sharing systems, and streamlined administrative processes can free clinical time for patient care.

3. **Extend reach through telemedicine and remote support:** Digital tools can also bridge geographic gaps. Telemedicine, remote diagnostics, and models like "D to P with N" (enabling physician consultation during nurse home visits) offer practical routes to earlier detection and better disease management in underserved areas.

4. **Enable effective task shifting:** Training alone does not expand capacity if new skills go unused. The Specified Acts Training System has certified only 11,840 nurses against a target of 100,000, and 31.6% of those trained report not performing specified acts at their workplace, reflecting barriers in protocols and institutional support. Objective indicators to assess task shifting progress, with results informing reimbursement and integration into professional standards, would help ensure that competencies developed translate into expanded capacity for early intervention.

5. **Address regional distribution:** Nearly twofold variation in physician density means corresponding variation in access to early intervention. Workforce planning based on regional and specialty needs, enhanced financial incentives for underserved areas, and systems enabling central facilities to support peripheral ones through telemedicine and physician dispatch would help ensure geography does not dictate access to timely care.

DOMAIN 6: MEDICINES AND TECHNOLOGY

What interventions are possible at each stage of disease depends on access to diagnostics and treatments. Japan ranks among the highest globally for density of advanced imaging equipment, and regulatory review has become more efficient, with median approval times of 313 days.

Yet gaps between regulatory capacity and actual availability are significant. Despite efficient review, 72.4% of pharmaceuticals approved in the US and Europe between 2016 and 2020 remained unavailable in Japan. The number of unapproved cancer therapies doubled from 21 to 44 over that period. The disconnect reflects pricing and commercial factors that delay access to treatments that might enable earlier and more effective intervention.

Japan's position in therapeutic innovation has also weakened. Japanese firms now account for just 3% of global antibody drug development and 1% of gene therapies. Participation in international clinical trials has dropped to 26.9%, against 81.5% in the US. These trends carry implications for long-term access to innovative therapies and for Japan's influence over which treatments reach the market.

Digital infrastructure, increasingly central to risk identification, early detection, care coordination, and patient engagement, lags international benchmarks. Primary care EMR adoption stands at 42%,

against an OECD average of 93%. Among those aged 70 and over, 50.9% do not use digital devices, limiting the reach of digital health tools in the populations most affected by NCDs.

Regional disparities in diagnostic equipment compound these challenges. Despite high national averages, prefecture-level variation exceeds threefold, creating unequal access to early detection.

RECOMMENDATIONS

1. **Reform value assessment:** The gap between approval efficiency and market availability reflects pricing that may undervalue therapeutic benefit. Assessment systems capturing clinical and societal value, including gains from earlier intervention, would better support timely access to effective treatments. Shifting from automatic price reductions to outcome-based adjustments would better incentivise innovation while maintaining affordability.
2. **Strengthen domestic clinical trial infrastructure:** Japan's capacity for clinical research requires investment. Annual clinical trial numbers have dropped to 665, ranking 14th globally behind India, China, and the US. Closer industry–academia–government collaboration through mechanisms such as AMED, promotion of decentralised trials using digital technology, and development of patient databases accessible to research sponsors would improve trial efficiency and quality.
3. **Accelerate global clinical development integration:** Declining participation in international trials (26.9% versus 81.5% in the US) limits access to innovative therapies. Accepting English-language documentation, using overseas trial data to expedite review, and strengthening networks for multi-country trials would improve Japan's position in global development and accelerate access to treatments enabling earlier action.
4. **Advance digital health strategy:** Low EMR adoption (42% in primary care against 93% OECD average) and limited digital literacy (50.9% of those aged 70 and over do not use digital devices) represent barriers to acting early. The Medical DX Reiwa Vision 2030 sets ambitious goals, but execution has lagged, particularly in smaller institutions. Strategies addressing both infrastructure and user capability, with targeted support for facilities under 200 beds and elderly digital literacy programmes, would help realise the potential of digital tools for risk identification, early detection, and care coordination.
5. **Reduce regional disparities in equipment:** High national averages mask threefold variation at prefecture level. Coordinated planning aligned with regional needs and Community Healthcare Visions, together with remote diagnostic networks linking specialists to underserved areas, would distribute early detection capacity more equitably.

DOMAIN 7: ENVIRONMENTAL SUSTAINABILITY

The relationship between NCD management and environmental sustainability runs in both directions, yet neither connection is reflected in current policy.

In one direction, early intervention offers environmental co-benefits. Research shows that inpatient care generates substantially higher emissions per patient than outpatient services, and that emissions rise with disease progression for conditions such as chronic kidney disease. Preventing hospitalisation and slowing disease advancement would reduce environmental as well as human costs. But these co-benefits go unrecognised: Health Japan 21 (Third Term), disease-specific strategies, and screening programmes contain no environmental dimension.

In the other direction, climate change affects NCD patients directly. Rising temperatures are linked to cardiovascular events and respiratory exacerbations. Summer 2018 saw over 95,000 heatstroke emergency transports and more than 1,500 deaths, concentrated among the elderly. Current adaptation efforts focus on acute heat illness; systemic vulnerabilities in NCD care during extreme weather (medication supply chains, dialysis capacity, emergency transport) receive less attention.

Japan's healthcare sector accounts for an estimated 6.4% of national greenhouse gas emissions, fourth highest globally, yet operates under largely voluntary decarbonisation commitments. Progress has been uneven: pharmaceuticals achieved a 35.6% reduction against 2030 targets, hospitals 22.6%, and 24% of private hospitals remain uncommitted. Healthcare is absent from the 14 priority areas in the 2021 Green Growth Strategy.

RECOMMENDATIONS

1. **Integrate environmental considerations into NCD policy:** Evidence linking disease progression to emissions growth provides a basis for recognising the environmental value of acting early. Incorporating environmental assessment into NCD policy evaluation, including Health Japan 21 and disease-specific strategies, would allow co-benefits to inform resource allocation.
2. **Strengthen climate adaptation for NCD services:** Growing climate risks fall disproportionately on NCD patients. Regional strategies based on vulnerability assessment, addressing emergency transport, medication supply, and dialysis continuity during extreme weather, would enable proactive rather than reactive responses.
3. **Build integrated climate and health surveillance:** Linking meteorological, environmental, and healthcare data would create a foundation for monitoring how climate change affects NCD outcomes. Real-time insights from such surveillance could inform both prevention strategies and service planning.
4. **Establish mandatory decarbonisation frameworks:** Voluntary commitments under the 2016 Plan for Global Warming Countermeasures have yielded inconsistent progress, with 24% of private hospitals uncommitted to any reduction efforts. Mandatory plans combining methodological flexibility with outcome accountability, and tiered support for smaller facilities including subsidies for high-efficiency equipment and renewable energy, would broaden participation in reducing healthcare's emissions footprint.
5. **Pursue dual-benefit strategies:** Some interventions serve both health and environmental ends. Housing insulation, supported by programmes such as Tottori Prefecture's energy-efficient housing subsidies, reduces emissions while lowering cardiovascular risk from temperature extremes. Prevention that averts high-emission inpatient care (which generates 5.4 times higher emissions per patient than outpatient services) delivers environmental gains alongside health improvements.
6. **Learn from international experience:** Japan's ATACH membership offers a platform for exchange. Drawing on approaches like NHS Net Zero would support development of strategies suited to local context.

Conclusion

Japan possesses considerable assets relevant to acting early on NCDs: universal coverage, extensive screening infrastructure, advanced diagnostics, and an established policy architecture. What this report suggests is that these assets are not always configured to maximise opportunities for early action, whether in prevention, detection, diagnosis, treatment initiation, or intervention to slow progression.

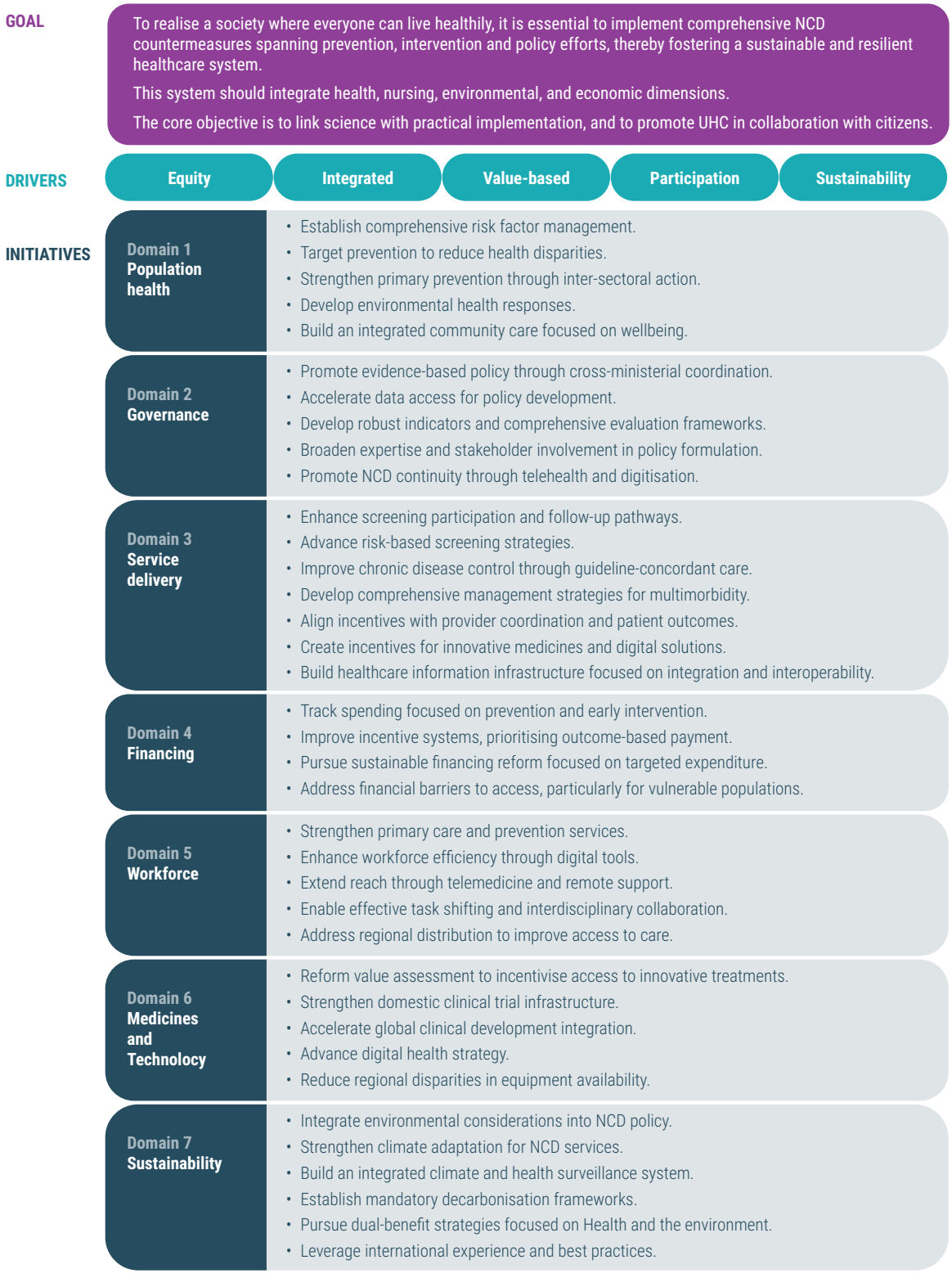
Certain themes recur across the seven domains. Coordination among ministries, providers, and payers frequently falls short of what acting early demands. Data and evidence that could inform timely intervention are not always accessible or applied. Financial incentives tend to reward treatment volume rather than outcomes from early action. Workforce capacity and distribution generate uneven access to the services that enable earlier detection and management. Promising

treatments face delays in reaching patients who might benefit from earlier use. The potential synergies between earlier NCD intervention, system sustainability, and environmental outcomes remain largely unexplored.

The recommendations in this report respond to these patterns. Their common thread is enabling the health system to act earlier across the full disease trajectory: preventing risk factors from developing into disease, detecting disease before it becomes symptomatic, diagnosing conditions before they advance, initiating treatment before complications arise, and intervening to slow progression before function is lost. This is less about creating new programmes than about reorienting existing structures so that earlier action becomes the default rather than the exception.

The demographic and fiscal pressures on Japan's health system are not receding. The fundamental aim is to match Japan's achievement in extending life with equivalent progress in extending healthy life. Achieving that will require acting early at every opportunity.

Figure 1. Vision to enhance the sustainability and resilience of the healthcare system



This figure presents a strategic vision addressing the structural challenges in Japan's health system, starting with the prevention and early intervention of NCDs. At the top, it establishes the common goal of "creating a society where all individuals can live healthily." To achieve this, five core values and principles (Drivers) are emphasised: Equity, Integration, Value-Based, Participation, and Sustainability.

Equity: Establish mechanisms to address disparities from both systemic and environmental perspectives, to ensure that everyone, regardless of age, gender, region, income, education, or social status, has access to and receives adequate and quality healthcare.

Integrated: Develop a holistic and community-focused healthcare system that transcends the fragmented, organ- and disease-specific medical care and administrative silos, and responds to the needs of individuals with multimorbidity and lifestyle or social challenges.

Value-based: Shift towards a healthcare model and health policies that prioritise outcomes, quality of life, and cost-effectiveness over the quantity of services provided, supporting value-based decision-making that yields the most optimal health outcomes under resource constraints.

Participation: Foster inclusive transparency in governance by enabling the participation and co-creation of diverse stakeholders, such as healthcare professionals, citizens, businesses, academic institutions, and the government, in the design, implementation, and evaluation of health policies.

Sustainability: Integrate, medical, care and welfare, and environmental policies to address complex challenges such as population aging, healthcare workforce imbalances, climate change, and fiscal constraints, by developing systems that remain adaptable for future generations.

By leveraging these drivers across seven key domains – population health, governance, service delivery, financing, workforce, medicines and technology, and environmental sustainability – specific policy initiatives have been developed that outline the direction for essential reforms in each area.

This figure illustrates the significance of NCD strategies beyond mere healthcare reform, highlighting their implications across economic, social, and environmental dimensions, and presents a comprehensive framework for building a future-oriented health system.

DOMAIN 1

Population health

Introduction

Japan faces a paradox in population health: it has the highest global life expectancy and healthy life expectancy [32][33], yet about 80% of deaths are due to non-communicable diseases (NCDs) [2]. This underscores the urgent need for policy actions to close the gap between lifespan and healthy ageing. Japan needs to strengthen its comprehensive NCD prevention strategies to manage the growing burden of unhealthy years and escalating healthcare costs. Building on successful initiatives such as universal screening programmes for specific age groups [34][35], this section examines trends in disease burden, risk factors, environmental impact, and existing preventive policies. These insights aim to inform more effective NCD prevention efforts that improve clinical outcomes and promote health equity throughout Japan.

Table 1. Key data on population health in Japan

Rank	Indicator	Past year	Latest year	Change (%)	
	Life expectancy/healthy life expectancy (years)	2016 [36]	2022 [36]		
	Life expectancy – MHLW data	Men 81.0 Women 87.1	Men 81.1 Women 87.1	Men 0% Women 0%	=
	Healthy life expectancy – MHLW data	Men 72.1 Women 74.8	Men 72.6 Women 75.5	Men 1% Women 1%	▲
		1990 [37]	2021 [37]		
	Life expectancy – IHME data	Men 76.2 Women 82.3	Men 82.2 Women 88.1	Men 8% Women 7%	▲
	Healthy life expectancy – IHME data	Men 67.6 Women 71.2	Men 72.2 Women 75.4	Men 7% Women 6%	▲
	Deaths per 100,000 population	1990 [37]	2021 [37]		
1	Neoplasms	193.3	363.5	88.09%	▲
2	Cardiovascular diseases	225.5	291.3	29.17%	▲
3	Neurological disorders	35.5	158.3	345.63%	▲
4	Respiratory infections and Tuberculosis	53.1	77.1	45.16%	▲
5	Diabetes and kidney diseases	23.6	49.4	109.27%	▲
6	Digestive diseases	30.4	47.5	56.54%	▲
7	Chronic respiratory diseases	24.5	47.2	92.39%	▲
8	Unintentional injuries	12.9	32.2	148.53%	▲
9	Self-harm and interpersonal violence	19.1	17.9	-5.90%	▼
10	Other non-communicable diseases	7.3	15.8	114.95%	▲
	Age-standardised deaths per 100,000 population	1990 [37]	2021 [37]		
1	Neoplasms	146.1	111.6	-23.59%	▼
2	Cardiovascular diseases	186.4	72.5	-61.12%	▼
3	Neurological disorders	32.1	33.3	3.62%	▲
4	Respiratory infections and Tuberculosis	44.7	17.6	-60.66%	▼
5	Digestive diseases	23.8	13.7	-42.61%	▼
6	Self-harm and interpersonal violence	15.8	13.6	-14.07%	▼
7	Diabetes and kidney diseases	19.0	11.8	-38.05%	▼
8	Chronic respiratory diseases	19.8	11.5	-41.99%	▼
9	Unintentional injuries	11.4	10.0	-12.69%	▼
10	Other non-communicable diseases	9.5	6.0	-37.03%	▼
	Age-standardised DALYs by disease	1990 [37]	2021 [37]		
1	Musculoskeletal disorders	2,556.3	2,575.2	0.74%	▲
2	Neoplasms	3,580.4	2,526.3	-29.44%	▼
3	Mental disorders	1,559.0	1,750.3	12.28%	▲
4	Cardiovascular diseases	3,512.5	1,651.0	-53.00%	▼
5	Neurological disorders	1,128.3	1,183.9	4.92%	▲
6	Other non-communicable diseases	1,300.0	905.1	-30.38%	▼
7	Unintentional injuries	1,101.3	794.5	-27.86%	▼
8	Diabetes and kidney diseases	711.1	752.5	5.81%	▲
9	Self-harm and interpersonal violence	702.5	682.5	-2.84%	▼
10	Skin and subcutaneous diseases	622.2	643.7	3.45%	▲

Notes: Life expectancy data from both MHLW and IHME are presented as calculation methods differ. Rankings are based on 2021 data.

Subdomain 1.1: Burden of disease

Trends in life expectancy and healthy life expectancy

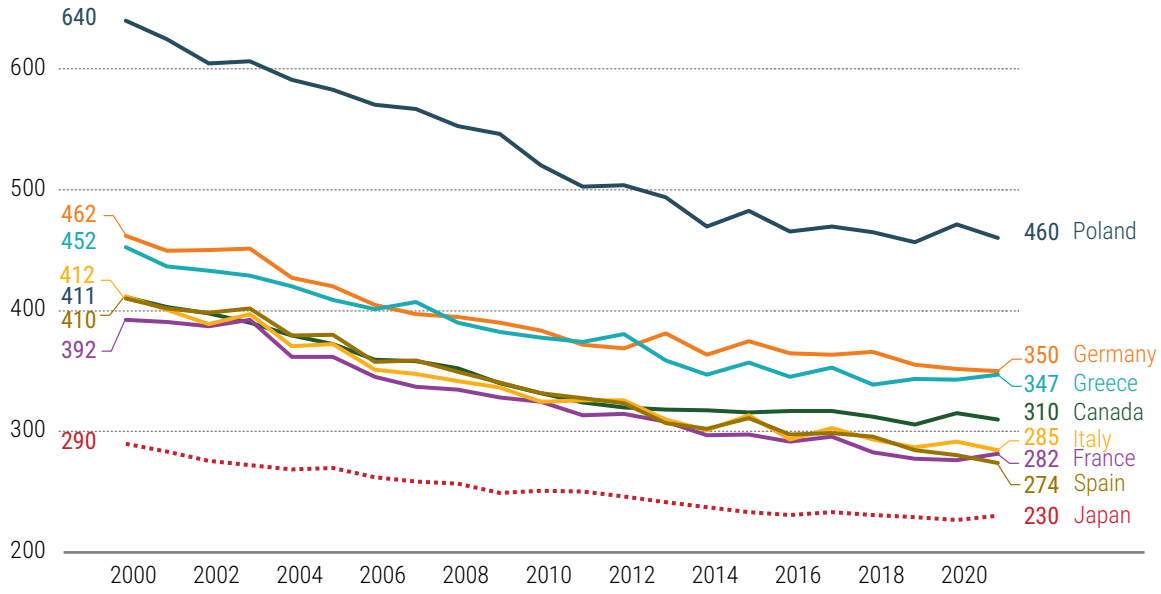
The extended lifespan of the population in Japan is accompanied by a rise in prolonged periods of illness, which affects the sustainability of health systems. The disparity between total life expectancy and healthy life expectancy is increasing, resulting in personal hardships and economic strain. According to Global Burden of Disease (GBD) 2021 data, Japanese men spend 9.9 years and women 12.7 years in poor health, and these gaps have widened since 1990 [1]. While the Japanese Ministry of Health, Labour and Welfare (MHLW) reports smaller gaps (8.5 years for men and 11.6 years for women in 2022), both datasets show that a large portion of the population experiences activity limitations and poor health during their lives [36][38]. This extended period of ill health increases medical costs and care demands, threatening the long-term viability of Japan's health systems and social support systems.

Leading Causes of death and their composition

NCDs are Japan's leading cause of death, responsible for 87.1% of all fatalities. Understanding disease patterns is vital to prioritising interventions and reduce NCD-related mortality. Analysis of 2021 mortality data shows malignant neoplasms at 32.3%, followed by cardiovascular diseases (25.9%), neurological disorders (14.1%), respiratory infections and tuberculosis (6.9%), and diabetes and kidney diseases (4.4%) [2]. COVID-19 accounted for only 0.6%, while infectious, maternal, neonatal, and nutritional diseases made up 7.5%, and injuries 4.8% [2]. This data highlights that addressing NCDs is a key challenge in reducing mortality, which will require effective policy measures across various disease groups.

Despite the overall NCD burden, Japan has achieved reductions in age-standardised mortality from NCDs. Figure 2 shows data for Japan and seven other PHSSR countries in scope, all of which show reductions in mortality between 2000 and 2021, though at markedly different rates. While all countries show a significant downward trend, Japan's more modest 20.5% reduction compared to reductions exceeding 30% in Spain, Italy, and Poland's may be partly attributed to the already-low baseline rate.

Figure 2. Age-standardised NCD mortality rate (per 100,000 population), 2000–2021

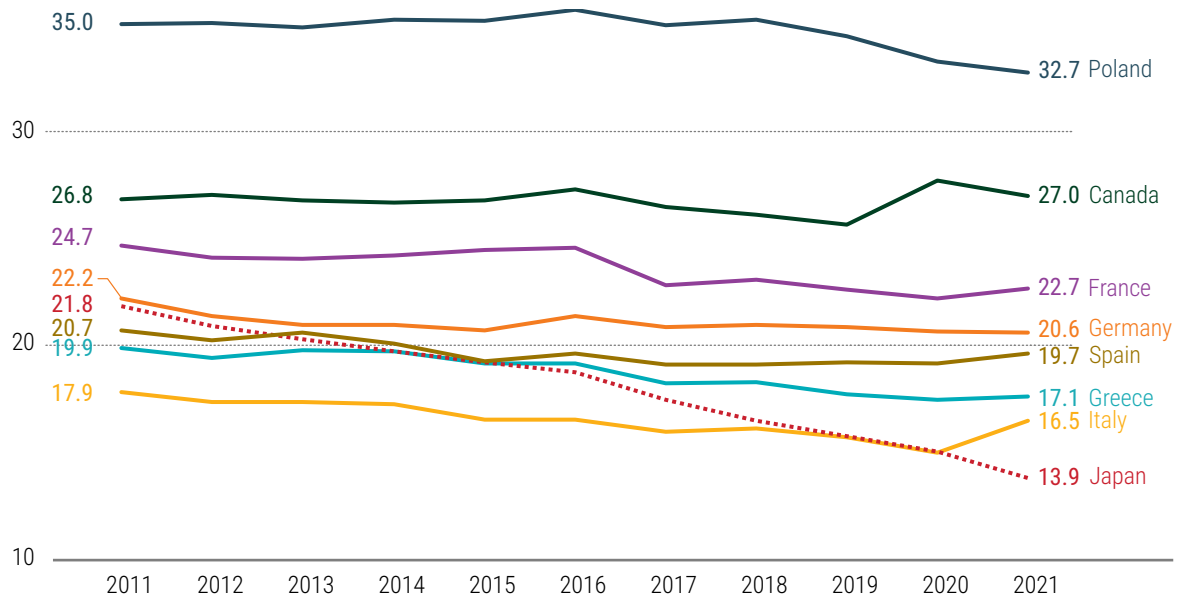


Source: WHO Global Health Observatory Data Indicators.

However, despite the gains in reductions over the past two decades, the pace of NCD mortality reduction has slowed across all eight countries. The average annual reduction between 2010–2021 declined to 0.98%, compared to 1.78% the decade earlier between 2000–2010, constituting a 45% relative slowdown. The deceleration in rates of improvement underscores the need to maintain and double down on efforts to address NCDs at a broader scale.

This is particularly pressing given the impact of NCDs on healthy and productive life years resulting from premature mortality. Figure 3 shows the percentage of premature deaths as a proportion of all NCD deaths between 2011 and 2021 across all eight PHSSR countries in scope. When analysing the data, several disparities become apparent. Between 2012 and 2021, most European countries achieved modest reductions (6–12%) when compared to Japan's 38.6% reduction (from 22.56% to 13.85%). However, by 2021, a wide divergence persists across all countries in scope, ranging from 13.85% in Japan to 32.71% in Poland, a 2.4-fold variation, suggesting that health system differences are particularly pronounced in preventing early deaths.

Figure 3. Premature deaths due to NCDs as a proportion of all NCD deaths (%), 2011–2021 or latest



Source: WHO Global Health Observatory Data Indicators.

Burden of NCDs and temporal changes

Despite overall progress, Japan's rate of reducing NCD burden is slowing, indicating that existing strategies need further strengthening and innovation to sustain health gains. Age-standardised Disability-Adjusted Life Years (DALYs) for NCDs decreased by 21.4% from 1990 to 2021, falling from 17,290.0 to 13,593.9 per 100,000 population [2]. However, the annual improvement rate slowed from -1.04% (1990–2000) to -0.64% (2000–2021), suggesting that current interventions are becoming less effective [2]. Disease-specific analysis shows significant improvements in age-standardised DALYs for gastric cancer (-65.8%), ischaemic heart disease (-56.0%), and COPD (-43.2%), while those for diabetes (+21.9%) and pancreatic cancer (+9.0%) have deteriorated over the past thirty years. Given Japan's rapidly ageing population and its associated impact on NCD dynamics, these findings suggest an urgent need to accelerate progress through innovative and age-adaptive policy approaches to address the trends in population health.

Subdomain 1.2: Metabolic and behavioural risk factors

Contribution of risk factors

Over 40% of Japan's NCD burden stems from preventable metabolic and behavioural risk factors, representing an opportunity for population health improvement through targeted policies. In 2021, metabolic risk factors accounted for 21.4% and behavioural risk factors for 19.0% of NCD-related DALYs, collectively comprising 40.4% of the total burden [2]. High blood glucose emerges as the leading contributor at 9.4%, followed by high blood pressure (8.7%) and smoking (8.3%) [2]. The burden of disease could be significantly reduced by initiatives that focus on modifiable risk factors, rather than solely on therapeutic management following disease onset. Such evidence-based prevention strategies could yield substantial health gains, potentially reducing the NCD-related burden.

Trends in disease burden from metabolic risk factors

Japan has made significant progress in reducing several major metabolic risk factors, but important gaps still exist. Ongoing efforts to tackle issues like diabetes and obesity are necessary. From 1990 to 2021, DALYs decreased considerably for high blood pressure (-60.7%), high LDL cholesterol (-56.5%), and impaired kidney function (-40.1%) [2]. These gains are likely due to comprehensive cardiovascular policies and widespread screening programmes. Nevertheless, high blood glucose showed limited improvement (-12.7%), and high BMI actually increased (+6.1%) [2]. Future primary prevention strategies should include enhanced lifestyle interventions and behavioural modification efforts.

Changes in disease burden from behavioural risk factors

Japan's comprehensive tobacco control and nutrition policies have shown significant population health benefits, serving as models for tackling other behavioural risk factors. Smoking-related DALYs decreased by 48.3% from 1990 to 2021, primarily due to indoor smoking bans and progressive tobacco taxation introduced in the amended Health Promotion Act of 2020 [39]. Similar declines were observed in alcohol-related DALYs (-44.5%) and high sodium intake (-71.2%), reflecting coordinated policy efforts [2]. Physical inactivity-related DALYs also fell by 24.9% [2]. Measures like the Health Promotion Act of 2020 demonstrate that comprehensive policy interventions can deliver substantial improvements in population health when applied across multiple behavioural areas.

Subdomain 1.3: Environmental impact on NCDs

Impact of the environment on NCDs

Environmental factors pose an increasing risk to NCD patients, especially elderly individuals with existing cardiovascular and metabolic conditions, highlighting the need for comprehensive climate adaptation strategies to safeguard vulnerable groups. Although environmental risk factors currently make a relatively small contribution to NCD DALYs – 2.5% from air pollution and 1.3% from non-optimal temperatures in 2021 – these impacts are expected to intensify with climate change [2]. Japan's diverse geography, spanning from subarctic Hokkaido to subtropical Okinawa, results in varying regional vulnerabilities that demand tailored responses. Heat-related mortality data illustrate this rising threat: annual heatstroke deaths rose nearly fivefold from 318 (1995) to 1,651 (2023), with elderly deaths increasing from 56.3% to 83.3% of total heat-related mortality [40]. This trend particularly endangers NCD patients whose cardiovascular and metabolic conditions heighten their susceptibility to heat.

Atmospheric conditions and NCD impact

Japan has achieved notable improvements in air quality compared to global standards, yet new pollution challenges require ongoing efforts. Comprehensive environmental health strategies must tackle both traditional and emerging air quality threats. Japan's NCD mortality rate from air pollution (33.7 per 100,000) remains well below the global average (87.7), reflecting decades of regulatory efforts under the Air Pollution Control Act since 1968 [42][2]. Major pollutants, including PM2.5, carbon monoxide, nitrogen dioxide, and sulphur dioxide, generally meet environmental standards [43]. However, photochemical oxidants (ozone) continue to exceed standards at many monitoring sites, posing respiratory risks for NCD patients with pre-existing conditions [43][44]. This highlights that environmental health protection demands continuous attention and policy efforts as new challenges emerge despite overall progress.

Subdomain 1.4: Primary prevention

Fundamental policies and plans supporting public health promotion (Health Japan 21)

Japan's Health Japan 21 strategy provides a strong foundation for NCD prevention, but notable implementation challenges limit its effectiveness. The objectives set out by the strategy require better coordination and evidence-based strategies for this initiative to be successful. The third edition of Health Japan 21 (2024) sets out three main policies: improving individual behaviour and health status, enhancing the social environment, and promoting health throughout life [45]. These three pillars form the conceptual backbone for addressing NCD prevention across multiple sectors. This comprehensive approach aims to address major NCDs through multi-sectoral initiatives such as workplace screenings, guidance from health insurers, local government health promotion, and private sector partnerships. However, ongoing challenges in lifestyle indicators suggest implementation gaps must be addressed through improved coordination, increased funding, and better targeting of high-risk groups.

Japan has established sophisticated disease-specific prevention frameworks; however, low screening rates and persistent trends in risk factors indicate considerable potential for improvement. Enhanced promotion and access to screening strategies are essential for prevention initiatives to be successful. Cancer control through Health Japan 21 (third term) aims to reach 60% screening rates for major cancers by 2028; nevertheless, current rates remain below this target [46][47]. Cardiovascular disease prevention via the Basic Act on Stroke, Heart Disease and Other Cardiovascular Disease Measures highlights primary prevention, especially smoking cessation, salt intake reduction, and encouraging regular exercise [48][49]. COPD prevention faces particular hurdles, with awareness remaining at only 27.8% despite a target of 80% [14][46]. Furthermore, despite the inclusion of a COPD mortality reduction target in Health Japan 21, there is a lack of systematic, nationwide policy measures for COPD. Strengthening early detection and incentivising primary care physicians to diagnose and refer suspected COPD cases could help address the high rate of underdiagnosis and improve outcomes for this growing patient population. These examples underscore the importance of both behavioural improvements and enhanced social environments, as advocated by the first two pillars of Health Japan 21. While the structural policies exist, implementation and promotion strategies require significant improvement to achieve measurable impact at the population level.

Structural challenges in policy

Despite comprehensive policies, trends in key lifestyle indicators indicate that more effective intervention strategies are needed to achieve the national prevention targets. Policy innovation must address the social determinants driving persistent unhealthy behaviours. In 2023, the average daily salt intake (9.8g) remained nearly twice the WHO recommendation (5.0g), while rates of regular exercise remained low (36.2% for men and 28.6% for women) [5][51]. Daily steps have fallen over

the past decade, and hypercholesterolemia rates are rising among women, from 17.3% in 2016 to 22.4% in 2019 [5]. Being underweight among elderly populations presents mortality risks that require specific attention [46]. These ongoing challenges are linked to socioeconomic factors, with an analysis from 2010 to 2015 revealing mortality disparities of up to 40% based on educational background and significant income-related differences in health behaviours [52][53]. The WHO's 2023 assessment rated Japan's tobacco control measures as inadequately aligned with international standards, particularly in terms of advertising restrictions and passive smoking prevention [54]. This demonstrates that the second core policy – improvement of the social environment – remains insufficiently addressed, especially in tackling structural barriers to health equity.

Multimorbidity and well-being

The complex challenges of multimorbidity and social isolation require Japan to shift beyond traditional medical models towards comprehensive well-being approaches. For patients with multimorbidity, simply combining treatment guidelines for each condition can lead to excessive treatment, which may harm patients' health and quality of life [55]. Survey data show that 80.2% of elderly residents in Tokyo have two or more chronic conditions, with 61.5% having three or more [56]. Social isolation increases mortality risks from cardiovascular diseases and cancer, while raising the risk of diabetes [57][58]. Japan's response includes strengthening community connections in Health Japan 21, alongside a Cabinet Office priority plan to tackle loneliness and isolation [50][59]. The Community-Based Integrated Care System offers integrated healthcare, nursing, prevention, housing, and lifestyle support – this is particularly pressing given that most of those from the baby boomer generation will become seniors by 2025 [60]. Successful models, such as Yabu City's social prescribing programme, highlight the potential of collaborative approaches linking medical care with community support [61][62]. Initiatives like "CONNECT DAY YABU" enable residents to self-assess their physical and mental health via digital tools, sharing results with community health nurses and specialists for personalised support [62]. However, ongoing stigma regarding chronic conditions like diabetes complicates workplace accommodation and access to treatment [63][64]. These examples illustrate the third pillar of Health Japan 21 – promotion of health throughout the life course – by shifting the focus toward integrated, person-centred models of support that accommodate ageing and chronic conditions.

Subdomain 1.5: Key findings, summary indicators and recommendations

KEY FINDINGS

- While Japan leads globally in life expectancy and healthy life expectancy [32][33] and is supported by initiatives like Health Japan 21, GBD estimates reveal widening gaps between life expectancy (82.2 years for men, 88.1 years for women) and healthy life expectancy (72.2 years for men, 75.4 years for women), indicating increasing periods of ill health that strain the health system [1].
- Although age-standardised NCD DALYs improved 21.4% from 1990–2021, improvement rates decelerated from -1.04% annually (1990-2000) to -0.64% (2000–2021) [2]. While diseases like gastric cancer (-65.8%) and ischaemic heart disease (-56.0%) showed marked improvement, diabetes (+21.9%) and pancreatic cancer (+9.0%) worsened [2].
- In 2021, metabolic (21.4%) and behavioural (19.0%) risk factors accounted for 40.4% of NCD DALYs [2]. Significant improvements occurred in high blood pressure (-60.7%), high LDL cholesterol (-56.5%), and smoking (-48.3%), though high blood glucose showed limited improvement (-12.7%) and high BMI increased (+6.1%) [2].

- Heatstroke deaths increased fivefold from 1995–2023, with elderly deaths (>65 years) rising from 56.3% to 83.3% [41]. While air pollution mortality remains below global averages [2], photochemical oxidant levels continue to exceed environmental standards [43].
- Despite comprehensive policies showing improvements in age-standardised cancer mortality rates [50], lifestyle indicators require significant improvement [65]. Daily salt intake remains nearly double WHO recommendations [5][51], exercise rates remain low, and cholesterol levels are increasing among women [5]. Health disparities linked to socioeconomic factors persist across multiple indicators [52][53].

KEY PERFORMANCE INDICATORS AND CURRENT MEASUREMENTS

- Gap between Healthy Life Expectancy and Life Expectancy: 9.9 years (men), 12.7 years (women) in 2021 [1]. This indicator measures periods requiring nursing care or activity limitations due to disease, trending upward since 1990.
- Age-standardised DALYs for NCDs: 13,593.9 per 100,000 population (2021) [2]. Although the comprehensive disease burden measure has improved by 21.4% since 1990, this positive trend is threatened by a slowing improvement rate and a marked worsening in diabetes (+21.9%) [2].
- DALYs Attributable to risk factors: high blood glucose 9.4%, high blood pressure 8.7%, smoking 8.3%, high BMI 4.8%, kidney dysfunction 4.4% (2021 NCD DALY contributions) [2]. This distribution highlights the relative impact of each factor, strongly emphasising the importance of metabolic risk.
- Environmental health impacts: air pollution 2.5%, non-optimal temperatures 1.3% (2021 NCD DALY contributions) [2]. These figures indicate the increasing impact of climate change on the national disease burden.
- Prevention strategy achievement rates: Specific Health Checkup rate 58.1% (2022) [3]; cancer screening rates vary by type (breast mammography 44.6% for women aged 50–69 [13], gastric cancer 37.2% for adults aged 40+ [4]); lifestyle indicators include daily salt intake 9.8g [5], regular exercise habits 36.2% (men), 28.6% (women) [5], average daily steps 6,628 (men), 5,659 (women) in 2023 [5].

INDICATORS TO BE DEVELOPED IN THE FUTURE

- Structural health disparity evaluation: indicators evaluating health status, preventive care access, and health behaviour disparities based on educational background, income level, and regional characteristics. Visualising socioeconomic impacts on health disparities and validating intervention appropriateness is crucial.
- Multimorbidity understanding: indicators evaluating NCD multimorbidity patterns, severity, and correlation with medical costs. Current disease-specific evaluations do not fully clarify interactions among multiple diseases and socioeconomic factors. Comprehensive indicators for elderly multimorbidity prevention and management should be prioritised.
- Complex risk factor evaluation: indicators capturing multiple risk factor presence (high blood pressure, high blood glucose, high BMI, smoking) and evaluating health outcome impacts. Given that metabolic and behavioural risks account for 40.4% of DALYs, indicators establishing risk patterns and informing countermeasure implementation are needed.
- Environmental factor health impact: monitoring indicators for long-term evaluation of environmental factor impacts (climate change, air pollution, urban living conditions) on NCDs. Evaluation mechanisms for assessing regional and population-based vulnerabilities and measuring climate change adaptation strategy effectiveness are essential.

- Integrated prevention measure evaluation: indicators that comprehensively track implementation status and evaluate the impact and outcomes of preventive measures for major NCDs. The effectiveness of community-based care systems and workplace health policies should be quantitatively visualised.

RECOMMENDATIONS

1. Enhancement of preventive healthcare to reduce health disparities: The design and implementation of preventive healthcare must incorporate institutional approaches that address individuals' social backgrounds. Preventive health strategies should target high-risk groups where mortality and health behaviour disparities often result from socioeconomic factors like education and income.

2. Qualitative improvement of multisectoral prevention strategies: Establish consistent prevention strategies for Health Japan 21 (Third Term) priority diseases and their associated multimorbidity, encompassing risk factor identification, intervention, and effect measurement. For diabetes, where improvement lags, introduce effective, evidence-based programmes. Effective preventive policy implementation requires the MHLW to engage in inter-ministerial collaboration to promote cross-sectoral initiatives encompassing the entire life course.

3. Establishment of comprehensive risk factor management systems: Develop and implement individually optimised preventive programmes for major DALY-contributing risk factors: high blood glucose (9.4%), high blood pressure (8.7%), and smoking (8.3%). Implement combined interventions for metabolic risk factor groups (high blood glucose, high blood pressure, high LDL cholesterol), and apply multilayered smoking interventions integrating behavioural science with fiscal policies, such as tobacco taxation and insurer-level incentive schemes. These economic measures are designed to enhance motivation and reduce accessibility, thereby complementing behavioural approaches.

4. Development of environmental health policies addressing climate change: Given the approximately fivefold increase in heatstroke deaths between 1995 and 2023, particularly affecting elderly NCD patients, implement regional-level adaptation strategies targeting climate change-vulnerable populations. Comprehensive air pollution measures, including addressing ongoing photochemical oxidant standard exceedances, are necessary.

5. Development of integrated community-based care focused on well-being: Shift from solely preventing and treating NCDs toward policies enabling patients to maintain good social and psychological states while managing conditions. Build comprehensive support systems that include stigma reduction, workplace accommodation and work-life balance support, social participation promotion, prevention of isolation, social prescribing advancement through multidisciplinary collaboration, and enhanced disease understanding.

DOMAIN 2

Governance

Introduction

Japan's NCD governance operates via an intricate, multi-tiered system that combines robust institutional frameworks with emerging coordination issues, threatening policy consistency. The MHLW leads national policy, while 47 prefectures and approximately 1,700 local governments carry out region-specific measures. This governance structure must strike a balance between maintaining national uniformity and allowing local flexibility, all while managing increasing inter-sectoral collaboration beyond traditional health sectors. The involvement of the Cabinet Office and Ministry of Economy, Trade and Industry underscores the recognition that effective NCD prevention requires coordinated efforts across economic, social, and health policies. Nevertheless, bureaucratic silos and limited stakeholder engagement hinder the system's capacity to tackle complex, multifaceted health issues. This analysis assesses institutional structures, use of expertise, data systems, strategic frameworks, and crisis management to identify governance reforms needed for enhanced NCD prevention and management.

Subdomain 2.1: Institutions

Policy formulation framework for NCD countermeasures

Japan has built comprehensive institutional structures for NCD governance, yet bureaucratic fragmentation undermines policy consistency and risks ineffective implementation. Clear institutional responsibility exists, but coordination mechanisms require strengthening to address complex health challenges effectively. Within the MHLW, dedicated divisions focus on major NCDs such as cancer, diabetes, cardiovascular diseases, and kidney diseases, collaborating with local governments and insurers [67]. Expert evaluation bodies like the Cancer Control Promotion Council and Cardiovascular Disease Control Promotion Council include medical professionals, patient advocates, and local officials to bring diverse perspectives [66]. However, the second Healthcare and Medical Strategy (2020–2024) revealed significant coordination issues within the bureaucracy, exposing challenges in policy coherence among ministries despite efforts to promote prevention, research, and healthcare industry development [68][4].

Role of local governments and healthcare provision system

Japan's healthcare governance effectively combines national policy consistency with regional flexibility, though improving coordination in implementation is needed to ensure efficient local delivery. This two-tier system allows for uniform standards while enabling community-specific interventions across various regions. The 47 prefectures create regional healthcare plans, while around 1,700 local governments oversee community health services [4]. The national government leads policy through standardised medical fees, subsidies, and guidance to local authorities, while prefectures tailor healthcare plans to local needs. This legal framework mandates efficient mechanisms to provide high-quality, appropriate healthcare, while permitting regional differences in how initiatives are implemented.

Evaluation of healthcare quality and clinical guidelines

Japan has developed sophisticated mechanisms for evaluating healthcare quality; however, challenges remain in ensuring guideline coherence and adopting new technologies. These systems provide foundations for evidence-based governance enhancement. The Japan Council for Quality Health Care conducts impartial assessments of medical institution functions, identifying areas for improvement and providing support [70]. Third-party evaluations are integrated into medical reimbursement conditions and cancer treatment hospital designation requirements, institutionalising regular quality assessments. Nevertheless, notable concerns persist regarding the actual quality of service delivery for NCDs, particularly in ensuring timely access to appropriate care, managing multimorbidity, and delivering coordinated services across primary and specialist care.

Clinical guidelines primarily emerge from professional societies, with the MHLW collaborating with relevant societies and the Pharmaceuticals and Medical Devices Agency (PMDA) to promote the optimal use of innovative pharmaceuticals through the "Guidelines for the Promotion of Optimal Use" [69]. While these guidelines serve as critical tools for clinical standardisation, ensuring coherence among multiple guidelines and establishing rapid evaluation processes for new medical technologies remain significant challenges.

Addressing health disparities

Japan's governance framework increasingly acknowledges health disparities as core policy issues, reflecting a broader understanding of how social determinants influence health outcomes. The MHLW has identified reducing health disparities related to regional and socioeconomic factors as a key goal in "Health Japan 21 (The Third Term)" [66]. Additionally, the "Basic Plan to Promote Cancer Control Programs (The Fourth Term)" emphasises developing and assessing indicator methods to measure regional health differences [71]. These efforts aim to visualise variations in NCD risk and outcomes across different regions and social groups, while supporting the creation of policies to address these disparities.

Subdomain 2.2: Expertise and inclusivity

Involvement of specialised institutions in policy formation

Japan has developed robust mechanisms for integrating specialised medical expertise into disease-specific policy-making, reflecting institutional maturity in evidence-based governance. These frameworks serve as models for expanding expertise integration in NCD prevention efforts. The MHLW has established specialised councils and advisory committees focused on particular diseases, ensuring expert input in policy formulation. For example, the Cancer Control Promotion Council involves experts from organisations like the Japan Cancer Association, patient advocates, and the Japanese Association of Social Workers in Health Services [72]. This council contributes to developing the "Basic Plan to Promote Cancer Control Programs", which guides prevention efforts, equitable regional healthcare, and research initiatives [73]. Likewise, the Council for Promotion of Measures Against Cerebrovascular and Cardiovascular Disease, along with the Study Group on Kidney Disease and Diabetes Countermeasures, includes university hospital specialists and patient organisation representatives as permanent members to review prevention and early detection strategies [74].

Challenges in utilising expertise in NCD prevention policy formulation

Despite strong disease-specific expert engagement, the inclusion of broader NCD prevention strategies is limited. The Promotion Expert Committee for Health Japan 21 (The Third Term) provides local governments with lifestyle improvement strategies but mainly comprises healthcare professional organisations such as the Japan Medical Association, Japan Nursing Association, and Japan Pharmaceutical Association [75]. Participation from academic societies focused on specific NCD domains remains limited, with experts from major societies, such as the Japanese Society of Hypertension and the Japan Diabetes Society, not included as permanent committee members [76]. Improved stakeholder engagement mechanisms and greater inclusion of evidence-based intervention strategies are essential for effective prevention policy development

Challenges in collaboration with private sector in policy formulation

Enhanced private sector engagement mechanisms are crucial for comprehensive NCD prevention that addresses food environments and behavioural determinants. Although dialogue forums exist for specific issues, including the "Study Group for Promoting a Sustainable Food Environment

Conducive to Natural Health" and "Alcohol Health Impairment Measures Stakeholder Meeting" [77], the expertise of the food and beverage industry is insufficiently utilised in the core decision-making processes of Health Japan 21. This limited the integration of industry insights regarding behavioural intervention strategies and food reformulation options, which contribute to effective prevention.

Involvement of patient and citizen groups in policy formation

The Cancer Control Promotion Council includes directors from the Japan Federation of Cancer Patient Groups and representatives from adolescent and young adult cancer patient associations [78]. Similarly, the Council for Promotion of Measures Against Cerebrovascular and Cardiovascular Disease involves individuals with experience in heart disease and stroke as council members [79]. In this manner, some policy councils do incorporate patient and citizen representatives.

However, several challenges exist in integrating patients and citizens into policy formation. First, there is a scarcity of patient and citizen representatives available to participate in medical policy councils, leading to a situation where a limited number of group members serve on multiple committees. Additionally, the frequent use of technical terminology creates barriers to participation, making it difficult for the general public to express their viewpoints.

The postponed review of the High-Cost Medical Expense Benefit System in March 2025 highlights these challenges [80][81][82]. Strong opposition from patient groups and academic societies led to the government's reconsideration following swift decision-making without sufficient patient consultation. The Medical Insurance Subcommittee held only four discussions [83], prompting patient groups to argue that the review was insufficient in detail [80]. Particularly concerning was that citizen groups involved primarily represented elderly populations, raising concerns about the limited data and the exclusion of working generation perspectives. This experience highlights the importance of comprehensive consultation processes that involve stakeholders from diverse backgrounds in advancing policy-making, while addressing increased social security costs resulting from an ageing population [84].

Governance challenges

Japan's governance reveals gaps that may limit policy responsiveness to diverse needs and health challenges. Diversity in decision-making is vital for NCD prevention. The OECD's "Government at a Glance 2023" indicates that Japanese ministers averaged 65 years in 2022, compared to the OECD average of 53 [6], suggesting that younger perspectives may be underrepresented. Female ministers were only 8%, far below the OECD average of 36%, underscoring the need to include women's perspectives in policy decisions [6].

Subdomain 2.3: Data and registries for policy formation

Evidence base for policy formation

Japan has developed sophisticated national databases that enable evidence-based NCD policy development, though access barriers limit their full utilisation potential. These systems represent significant investments in health and digital infrastructure requiring enhanced accessibility mechanisms. Three key nationwide databases support NCD policy formulation: the National Database of Health Insurance Claims and Specific Health Checkups of Japan (NDB) integrates insurance claims and Specific Health Checkup results from medical institutions nationwide [85]; the National Cancer Registry, initiated in January 2016, mandates cancer case reporting from all medical institutions [86]; and the Rare Disease Database collects clinical information on patients with designated rare diseases [9]. Since 2009, the NDB has served as a crucial evidence source for medical policy, particularly in formulating and evaluating healthcare expenditure optimisation plans [87].

Data access constraints limit policy development potential

Despite comprehensive data collection systems, significant utilisation barriers prevent optimal evidence-based policy formation and research advancement. Following legalisation of the NDB's third-party provision system in 2019, research institution and private entity usage has increased, yet a 2021 Health and Global Policy Institute report identified substantial data access issues [88]. Policymakers at national, local, and research levels face obstacles due to insufficient patient mortality data collection. The Cancer Registry Act, Article 20, specifies the required medical institutions and information items; however, some cancer site-specific data, other disease histories, or death dates of patients managed outside designated hospitals are not captured [89]. This limitation hinders analysis of factors contributing to reduced life expectancy in elderly cancer patients. Between 2018 and 2023, only 50 new uses of identifiable and anonymised information were reported [8], indicating underutilisation of valuable resources. Moving forward, it's essential to shift from 'entry regulation' to 'exit regulation' for managing patient data and establish legal frameworks similar to Europe's Health Data Space Regulation. Medical data should be defined as patient-owned, with clear guidelines for using both medical and non-medical data.

System for monitoring trends in risk factors

Japan maintains comprehensive national surveillance systems for NCD risk factors that align with international standards. These systems enable systematic health monitoring and evaluation, providing evidence for informed policy development. The MHLW conducts the National Health and Nutrition Survey annually, corresponding to WHO's STEPwise Approach to NCD Risk Factor Surveillance (STEPS). This survey measures physical activity levels, dietary habits, obesity rates, blood pressure, blood glucose levels, and cholesterol levels. Additionally, Specific Health Checkups and health guidance implementation monitoring for insured individuals aged 40–74, regular NDB data aggregation, and the National Health and Nutrition Survey continuously monitor metabolic syndrome and other NCD risk factor trends. These data serve as foundational inputs for policy formulation and evaluation indicators for Specific Health Checkups, health guidance, and various Health Japan 21 (The Third Term) measures [10].

Subdomain 2.4: Strategy and targets

Comprehensive national strategy framework

Japan has established national strategies for NCDs that offer comprehensive guidelines for prevention and management. However, there is room for improvement in coordinating implementation efforts and addressing multimorbidity. "Health Japan 21 (The Third Term)" is the main national strategy for 2023–2032, grounded in the goal of creating "a vibrant society where all citizens support each other and live healthy, fulfilling lives" [90]. Its focus is on reducing health disparities to eliminate socioeconomic-based differences in health outcomes. This broad approach includes primary prevention, health promotion, and social determinant strategies across various sectors and population groups.

Disease-specific strategies and progress management

Japan has formulated comprehensive, disease-specific strategies that convert national priorities into targeted actions. However, interdisciplinary coordination could be strengthened to better manage multimorbidity challenges. While these strategies support focused approaches, improved integration across different disease areas is needed. Despite progress, limitations remain in unifying evaluation indicators, promoting multi-sectoral collaboration, and enabling effective data utilisation for policy implementation. Cancer prevention is carried out through the "Fourth Basic Plan to Promote Cancer Control Programmes" (2023), which presents extensive measures from prevention to palliative care, highlighting the need for accurate screening and early detection strategies [91].

Cardiovascular disease prevention is directed by the "Second Japanese National Plan for Promotion of Measures Against Cerebrovascular and Cardiovascular Disease", aiming to create seamless healthcare systems from acute treatment to recurrence prevention. This plan stresses prevention, early diagnosis, enhanced emergency transport systems, and community medicine pathways for continuous care [92]. Disease-specific councils, including various stakeholders like cancer patients in the Cancer Control Promotion Council, oversee the implementation of these strategies, regularly reviewing progress and considering necessary updates [93].

Setting strategic goals and challenges

Goal-setting mechanisms and target setting through SMART criteria are crucial for measuring effectiveness, yet several critical NCD areas lack appropriate disease-specific evaluation indicators. Current strategies establish specific numerical targets for outcome evaluation and primary prevention across cancer, cardiovascular diseases, and chronic respiratory diseases. Health Japan 21 (The Third Term) adopts key evaluation indicators including age-standardised mortality rates for cancer, cerebrovascular and heart diseases, and COPD, plus annual new dialysis patient numbers due to diabetic nephropathy [90]. However, several areas require improved goal-setting approaches: chronic kidney disease focuses solely on dialysis initiation rates with inadequate prevention and early detection indicators; asthma lacks sufficient quality of disease management indicators such as reducing emergency visits and improving patient quality of life; diabetes requires comprehensive indicators for preventing severe complications including blood glucose control status and complication incidence rates [90].

Inter-sectoral collaboration and implementation challenges

Effective NCD strategy implementation requires inter-sectoral collaboration and coordination mechanisms to address complex health determinants beyond traditional healthcare considerations. Current fragmentation limits cohesive intervention across multiple sectors and geographic levels. Health Japan 21 emphasises establishing regional and workplace collaboration councils, alongside joint health promotion initiatives with businesses and communities. Each prefecture sets specific measures and numerical targets in their medical plans, implementing regionally tailored initiatives [94]. However, challenges persist regarding the effectiveness of inter-sectoral collaboration and information sharing, particularly affecting the effectiveness of regional-level measures [95].

In particular, inter-sectoral fragmentation complicates the management of multimorbidity, which involves the coexistence of multiple chronic conditions such as heart disease and kidney disease. As current strategies are predominantly disease-specific, they fail to provide the cross-cutting support required for complex cases. Comprehensive care models that integrate multiple specialties are needed to address this growing burden, especially in the context of Japan's ageing population.

Subdomain 2.5: Crisis Preparedness and response

National-level crisis management system

Japan has established sophisticated legal and institutional frameworks for health crisis management that integrate decision-making and implementation systems across national and regional levels. The framework operates through legal structures including the Basic Act on Disaster Management, Basic Guidelines for Health Crisis Management, the Infectious Diseases Act, and the Act on Special Measures for Pandemic Influenza and New Infectious Diseases. Decision-making centres on the Cabinet Secretariat while implementation focuses on MHLW coordination [96]. The National Security Council (NSC) determines policies for critical situations, including health crises, while the Central Disaster Management Council formulates disaster prevention plans, and government task forces decide basic response policies for infectious disease pandemics. Ensuring medical access for NCD patients represents a critical priority identified by the Central Disaster

Management Council. Preparations during non-emergency periods are centred around the MHLW's Health Crisis Management Coordination Council, which focuses on stockpiling pharmaceuticals, organising medical institution frameworks, and strengthening coordination with related agencies.

Crisis response system in medical institutions

Despite Japan's health system's preparedness structure for crisis response through systematic infrastructure and specialised capabilities, effective implementation varies across regions and types of institutions. This preparedness framework enables continuous care for vulnerable NCD populations during emergencies. Healthcare is organised into "medical service areas" divided by population size, with each prefecture assigning at least one disaster base hospital per "secondary medical service area', which usually serves around 200,000 people [97]. These hospitals maintain disaster readiness through emergency power supply systems, stockpiles of pharmaceuticals and medical materials, and secured water and food supplies [98]. Disaster base hospitals prioritise high medical dependency NCD patients, including dialysis patients needing water and electricity supply, oxygen supply equipment stockpiling for patients on home oxygen therapy, and chemotherapy pharmaceuticals for cancer patients. Additionally, these institutions manage patient information during non-emergency periods to enable rapid patient reception during disasters and prepare to deploy specialised disaster medical teams to affected areas [98].

Specialised support system for NCD patients

Japan has developed advanced disease-specific crisis management systems led by medical societies that provide detailed guidance for maintaining NCD patient care during emergencies. These specialised systems encourage professional community involvement in crisis preparedness, yet require better coordination mechanisms. For cardiovascular diseases, the Japanese Circulation Society, Japanese Society of Hypertension, and Japanese College of Cardiology created "Guidelines for Disaster Medicine for Patients with Cardiovascular Diseases" based on experiences from the 2011 Great East Japan Earthquake. These guidelines offer specific disease management methods, including blood pressure control for hypertension patients, prevention of heart failure exacerbation, and management of anticoagulant therapy, along with practical advice on drug stockpiling and alternative medication selection [99]. The Japanese Society for Dialysis Therapy established a "Disaster Dialysis Medical Network" that centralises information on dialysis facility damage and patient accommodation capacity for coordination, detailing procedures for securing necessary water and electricity, and ensuring patient transport [100][101]. For respiratory diseases, multiple societies developed a "Self-Management Support Manual for Respiratory Disease Patients", providing detailed information for home oxygen therapy patients, including handling power outages, securing backup power, and preparing evacuation lists. It also provides guidance for asthma patients during disasters, including strategies for preventing panic attacks and avoiding exacerbation factors [102].

Digital health innovation accelerated by pandemic response

The COVID-19 pandemic sparked significant digital health innovations that improved the continuity of care for NCD patients, although barriers to implementation restrict widespread adoption and effectiveness. These advancements lay the groundwork for stronger crisis resilience and ongoing improvements in routine care. Traditional face-to-face consultations shifted to include online consultations, following relaxations in COVID-19 restrictions, offering multiple benefits for NCD patients beyond reducing infection risk. These include easing travel burdens for both physicians and patients, enhancing care continuity, and improving medication adherence [103][104]. Nonetheless, actual usage rates remain low due to several factors: difficulties among older patients with digital devices, shortages of IT-literate staff in healthcare facilities, financial burdens related to implementation and operation, and limitations in medical reimbursement. The pandemic underscored the need for rapid, real-time information sharing regarding infection status and

medical resources [105]. The Cabinet Secretariat's Medical Digital Transformation (DX) Promotion Headquarters and the MHLW have developed systems for sharing electronic medical record (EMR) information and digitising infectious disease reporting, moving towards establishing the "National Medical Information Platform" for centralised sharing of health, medical, and nursing care data. However, ongoing technical challenges include standardising medical information, enhancing facility interoperability, and strengthening security measures [106].

Reconstructing the healthcare delivery system

The COVID-19 pandemic revealed fundamental weaknesses in the healthcare system that compromised care for NCD patients and underscored the need for greater flexibility between routine and emergency healthcare services. These experiences offer valuable lessons for improving health system resilience while ensuring quality care across all health conditions. Insufficient bed capacity led to difficulties hospitalising COVID-19 patients across different regions, often straining healthcare delivery systems [107]. The shortage of infectious disease treatment beds also limited routine medical services, disrupting regular care and treatment for NCD patients. Postponements of cancer surgeries, interruptions to chronic disease check-ups, and restrictions on rehabilitation services significantly hampered the continuity of NCD care [106]. The MHLW has introduced the "Plan for Securing Hospital and Accommodation Treatment Facilities", which is being gradually refined through consultation with prefectural governments [108]. This plan sets out rules for securing and efficiently utilising hospital beds according to levels of infection. Nevertheless, key issues remain to be addressed, including creating flexible mechanisms for switching between routine and emergency healthcare, improving functional differentiation and collaboration among medical institutions, and efficiently allocating and training healthcare staff.

Subdomain 2.6: Key findings, summary indicators and recommendations

KEY FINDINGS

- According to the OECD's "Government at a Glance 2023", Japanese ministers averaged 65 years old in 2022 compared to the OECD average of 53 across 41 member countries, with female ministers comprising only 8% versus the OECD average of 36% [6]. This demographic composition risks insufficient consideration of younger generation and women's perspectives in NCD policy-making.
- Expert Committee for Health Japan 21 (The Third Term) does not include NCD-related academic societies and major private companies as permanent members, which restricts the use of the latest clinical knowledge and industry insights [76]. Patient and citizen representation faces challenges such as participant shortages and unequal engagement opportunities for certain groups. [109].
- Despite comprehensive systems including the NDB, National Cancer Registry, and Rare Disease Database, significant access barriers persist. Even after legalising the NDB's third-party provision system in 2019, cumbersome procedures requiring over a year from application to approval and limited analytical environments impede policy formation data utilisation [88].
- Evaluation indicators based on disease characteristics remain inadequate: chronic kidney disease focuses solely on dialysis initiation rates lacking preventive indicators; asthma lacks patient quality of life improvement indicators; diabetes lacks comprehensive severe condition prevention indicators, highlighting deficiencies in establishing multifaceted evaluation systems considering disease characteristics [32]
- The institutionalisation of online medical consultations and the promotion of DX have advanced, but challenges to implementation include difficulties among elderly patients in using digital devices, shortages of IT personnel in medical institutions, and high implementation

costs. Ensuring access to both online and in-person medical services for NCD patients and balancing responses to infectious diseases with routine medical services during the pandemic have become critical issues [96][110].

KEY PERFORMANCE INDICATORS AND CURRENT MEASUREMENTS

- Governance evaluation indicators: Minister average age 65 years, female minister proportion 8% [6] – OECD "Government at a Glance" governance indicator assessments for Japan.
- Policy Committee Composition: Council and committee meeting frequencies (documented in meeting summaries) and deliberation content publication rate (100%). Council participants and meeting minutes are available online.
- Data Infrastructure development status: NDB third-party provision system usage (data provided for cumulative 501 research projects by March 2024, with 120 new achievement reports from May 2023 to March 2024) [7]; National Cancer Registry usage (50 new instances of identifiable and anonymised information use and provision from 2018–2023) [8]; Rare Disease Database collection items (1. Basic Information, 2. Medical Expense Grant Assessment Items, 3. Research Group Survey Items, 4. Ventilator Use Presence, 5. Medical Institution Information, 6. Administrative Section) [9].These indicators reflect medical information data utilisation status.
- Strategic progress management indicators: Health Japan 21 evaluation indicator achievement rates (third interim evaluation expected in 2029; second final report showed 8 achieved items, 20 improving yet unachieved items, 14 unchanged items, 4 worsening items, and 7 items difficult to evaluate) [10]; disease-specific plan numerical target achievement status (e.g., cancer screening rates – second final evaluation showed colorectal cancer screening rates not meeting 50% target, with men's participation at 47.8% and women's at 40.9%, but showing improving trends) [111]. These indicators reflect national strategy goal achievement progress.
- Crisis response preparation status: Medical institutions offering online consultations (18,121 out of 113,352 nationwide medical institutions as of March 2023) [11]; EMR system adoption rates (2023 adoption status: 65.6% in general hospitals, 55.0% in general clinics) [12]. These indicators indirectly reflect healthcare delivery system crisis preparedness.

INDICATORS TO BE DEVELOPED IN THE FUTURE

- Policy effectiveness evaluation indicators: Develop evaluation methods measuring policy effectiveness through inter-ministerial collaboration, ensuring coherence among different initiatives, and assessing policy cost-effectiveness.
- Expertise utilisation effectiveness indicators: Develop indicators to evaluate the adoption of academic society and industry policy recommendations, their impact on policy, and their influence on policy formation processes. Assess how clinical insights and industry innovations are reflected in policies and the outcomes they generate. Additionally, establish indicators that describe the appropriate composition of policy discussion members, including healthcare professionals, patient representatives, and government official ratios. Practical indicators could include the presence of structured feedback mechanisms from expert bodies, documentation of how expert input is reflected in final policy drafts, and whether meeting records clearly track the rationale for policy decisions based on expert opinion.
- Data utilisation effectiveness evaluation indicators: Establish indicators evaluating evidence utilisation extent in policy formulation processes and policy influence. Develop methods measuring NDB and National Cancer Registry data application degrees in actual policy formation and resulting outcomes.

- Integrated evaluation indicators for preventive policies: Develop evaluation methods measuring preventive measure synergistic effects across multiple diseases and integrated effects of combining different preventive approaches. Establish indicators that quantitatively assess the comprehensive lifestyle-related disease prevention intervention's impacts and the synergistic effects of multiple preventive strategies.
- Evaluation indicators for care continuity during crises: Develop indicators to measure the development rates of medical institution business continuity plans (BCPs), the quality of pandemic chronic disease management, and equity in crisis healthcare access. Establish comprehensive methods to evaluate the continuity of NCD treatment and the impact on health outcomes during crises.

RECOMMENDATIONS

1. Promotion of evidence-based policy formation: Establish policy formulation and resource allocation systems based on evidence collected through inter-ministerial collaboration, with unified indicators set across ministries. The MHLW should restructure collaboration frameworks with relevant ministries to achieve this coordination.
2. Involvement of diverse stakeholders in policy formation: Promote policy-making process diversity, particularly by expanding expert and citizen participation opportunities. Enhance industry collaboration and institutionalise citizen involvement to build systems reflecting diverse insights in policy development.
3. Development of data utilisation infrastructure: Simplify NDB and National Cancer Registry usage requirements, establish cloud environment analysis infrastructure, and strengthen security measures. Create systems that facilitate utilisation of data necessary for policy formulation.
4. Systematisation of strategic goals: Develop comprehensive evaluation indicators for each NCD area, covering prevention to treatment, implementing goal management based on SMART criteria. Prioritise indicator development in disease areas currently lacking sufficient measures.
5. Strengthening crisis response systems: Establish healthcare delivery systems capable of responding to both routine and emergency situations by promoting widespread online medical consultation use, developing medical information sharing systems, and supporting the digitalisation of medical institutions.

DOMAIN 3

Service delivery

Japan's universal health system offers broad access but faces challenges in implementation that hinder early intervention outcomes. Since 1961, universal insurance has ensured access from prevention to treatment via Employee Health Insurance and National Health Insurance, maintaining uniform pricing and services nationwide, allowing "free access" without referrals. This framework supports the early detection and treatment of cancer, heart disease, and respiratory diseases. Yet, gaps in service coordination, regional equity, and integrated care remain. The system boasts advanced diagnostics and screening but struggles with fragmented pathways, low screening participation, and poor multimorbidity management. Despite technological advancements, these issues continue to hinder optimal population health outcomes. This analysis reviews clinical guidelines, risk assessment, screening, diagnostics, and preventive care to identify improvements for better NCD prevention and management across Japan's healthcare landscape.

Table 2. Key data on prevalence of screening programme in Japan

Indicator / screening rates (%)	Past year	Latest year	Change
Specific health checkups programme (individuals aged 40–74)	2012 [118]	2022 [118]	
	46.2	58.1	+26%
Mammography for breast cancer (women aged 50–69)	2009 [119]	2019 [120]	
Japan	23.8*	44.6	+87%
OECD average**	62.2	59.1	–
Gastric cancer (individuals aged 40 and over)	2013 [121]	2022 [121]	
	36.7	37.2	+1%
Colorectal cancer (individuals aged 40 and over)	2013 [121]	2022 [121]	
	35.4	41.5	+17%
Lung cancer (individuals aged 40 and over)	2013 [121]	2022 [121]	
	38.7	45.0	+16%

Notes:
* 2007 data.
** Percentage change not presented as OECD average based on 15 countries in 2009 and 32 countries in 2019.

Subdomain 3.1: Clinical guidelines and protocols

Comprehensive guideline development

Japan has established sophisticated clinical guideline development processes led by specialised medical societies that provide comprehensive coverage across NCD prevention, diagnosis, and treatment domains. Each specialised medical society formulates clinical guidelines with periodic revisions, supported by the Japan Council for Quality Health Care's Medical Information Distribution Service (Minds), serving as a public platform for evaluation and dissemination of approximately 450 clinical guidelines as of 2025 [112]. These guidelines offer comprehensive recommendations that span prevention, diagnosis, early detection, and treatment across multiple disease domains. Cancer guidelines are developed by each specialised medical society for different cancer types, published comprehensively by the Japanese Society of Clinical Oncology [113], with cancer genome medicine advances enabling personalised medicine guideline development [114]. Cardiovascular disease guidelines are developed by the Japanese Circulation Society and other specialised societies, covering specific diseases such as ischaemic heart disease, as well as comprehensive clinical

guidelines addressing prevention and complications across various diseases [115]. Chronic respiratory disease guidelines are published by the Japanese Respiratory Society for COPD and bronchial asthma [116], with recommended updates every 3–5 years [117].

Implementation incentives for quality promotion

Japan has established comprehensive incentive mechanisms that effectively encourage the implementation of clinical guidelines through economic and quality assurance systems. These mechanisms serve as models for systematic quality improvement, but also require improved monitoring capabilities. Economic incentives are delivered through the Medical Service Fees[1] system, with cancer treatment cooperative hospitals designated as regional cancer care hubs receiving extra medical reimbursements [122]. To qualify for this designation, hospitals must provide standard treatments aligned with clinical guidelines [123]. Third-party hospital evaluation agencies include clinical guideline utilisation as an evaluation criterion [124], and guideline adherence is integrated into the Quality Indicators (QI) process evaluation, which measures healthcare appropriateness [125]. The QI publication system promotes continual healthcare quality improvements at individual hospitals [126], fostering the standardisation of clinical care through multiple reinforcing mechanisms.

Systems ensuring the quality of healthcare

Japan has put in place institutional systems to monitor adherence to guidelines and maintain healthcare quality, but standardisation across different institutions needs improvement for greater effectiveness. Medical institutions continuously monitor adherence to clinical guidelines through multiple healthcare quality assurance mechanisms. One example is the implementation of clinical pathways in large hospitals to establish standard treatment processes based on clinical guidelines [127]. Continuous medical education linked with specialist systems maintains and enhances healthcare professionals' knowledge and skills based on clinical guidelines, facilitating standardisation and healthcare quality improvement [128]. These institutional mechanisms support facility-level quality assurance while also promoting increased cross-institutional coordination to effectively measure system-wide performance.

Challenges in multimorbidity guidelines

Japan faces significant challenges in developing comprehensive guidelines for patients with multimorbidity, particularly given the population ageing trends and complex care needs. Moreover, improved cross-disease coordination mechanisms are essential for delivering comprehensive care for comorbid and elderly patients. While clinical guidelines help enhance healthcare quality and standardisation, comprehensive guidelines for multimorbidity patients remain inadequate, particularly for elderly individuals with multiple conditions who are vulnerable to health issues caused by polypharmacy [129]. Although some disease-specific guidelines address common complications, few systematically incorporate management strategies for coexisting chronic conditions or explicitly address polypharmacy. Cross-disease treatment strategies are crucial. While

[1] Medical Service Fees refers to the fees that healthcare providers charge for medical services and pharmaceuticals covered by health insurance plans. These fees are set through a medical service fee point system in which 1 point equals 10 yen. All healthcare providers throughout Japan are required to comply with the medical service fee points and calculation requirements for health services, medical devices, and pharmaceuticals that are set by the MHLW, and providers are prohibited from charging medical fees in excess of these set amounts. In general, providers may not provide patients with combinations of insurance-covered and non-covered treatments (mixed medical treatments); however, mixed medical treatments are allowed for situations covered by the Special or Specified Medical Care Coverage System. The Special or Specified Medical Care Coverage System applies to situations involving advanced treatments and Patient-Proposed Health Services (PPHS) that are under evaluation for insurance coverage as well as elective treatments not intended for coverage.

guidelines addressing complications exist for conditions like diabetes [130], they should be broadened to cover other disease areas. Monitoring guideline adherence is still fragmented across institutions, with no standardised cross-institutional monitoring systems, which may lead to variations in care based on institutional experience and practitioner expertise.

Clinical pathway implementation and QI measurement face significant structural barriers that limit comprehensive quality improvement, particularly in medium and small medical institutions with resource constraints. Clinical pathways face challenges including securing personnel for aggregating and analysing variance data – instances where practice deviates from expected pathways – and establishing procedures for rectification and consensus for pathway implementation [127]. Medium and small medical institutions face challenges in securing staff and budgets, which can hinder ongoing quality improvement activities. Additionally, QI measurement, collection, and analysis are challenged by incomplete data linkage and standardisation across medical information systems, making comparisons across multiple healthcare institutions difficult [125].

Subdomain 3.2: Risk assessment

Overview of the risk assessment system

Japan has implemented a sophisticated population-wide risk assessment system; however, barriers to participation limit its optimal effectiveness and coverage. Risk assessment operates primarily through the Specific Health Checkups and Individual Health Guidance system introduced in 2008 [131]. This system mandates Specific Health Checkups for individuals over 40 by health insurers, with approximately 58.1% of eligible individuals undergoing checkups in 2022, supporting early detection and intervention of health risks [3]. This comprehensive approach provides population-level screening but also reveals significant participation gaps that require targeted improvement strategies.

Current status of disease-specific risk assessment

Advanced disease-specific risk assessment has been leveraged using scientific advances, especially in cancer genetics and cardiovascular prediction. Despite these advances, better integration is needed across other disease areas. Nevertheless, these systems serve as models for precision medicine in oncology, where models for different cancers are being developed, incorporating genetic mutation-based risk assessments, such as BRCA1/2, in breast cancer [132]. Cardiovascular risk scores based on Japanese data [133] are utilised in the management of hypertension and dyslipidaemia, helping to prompt timely interventions [134]. While these methods demonstrate advanced risk stratification, improved integration is needed to ensure broader coverage across patients and disease areas, particularly for cross-disease risk assessment in interconnected conditions.

Risk assessment in primary care

Primary care physicians effectively integrate multiple risk assessment approaches to provide comprehensive patient evaluation. Nevertheless, system fragmentation limits the effectiveness of optimal coordination and continuous risk management. Enhanced integration mechanisms are essential for risk management across healthcare settings. Primary care physicians conduct comprehensive risk assessments by combining regular health checkup results with risk assessment tools, facilitating lifestyle-related disease prevention and early detection of conditions such as diabetes and hypertension [133]. These physicians offer vital coordination via specialist referrals when necessary [135], highlighting the primary care setting's key role in risk assessment while emphasising the need for improved system integration.

Challenges in risk assessment

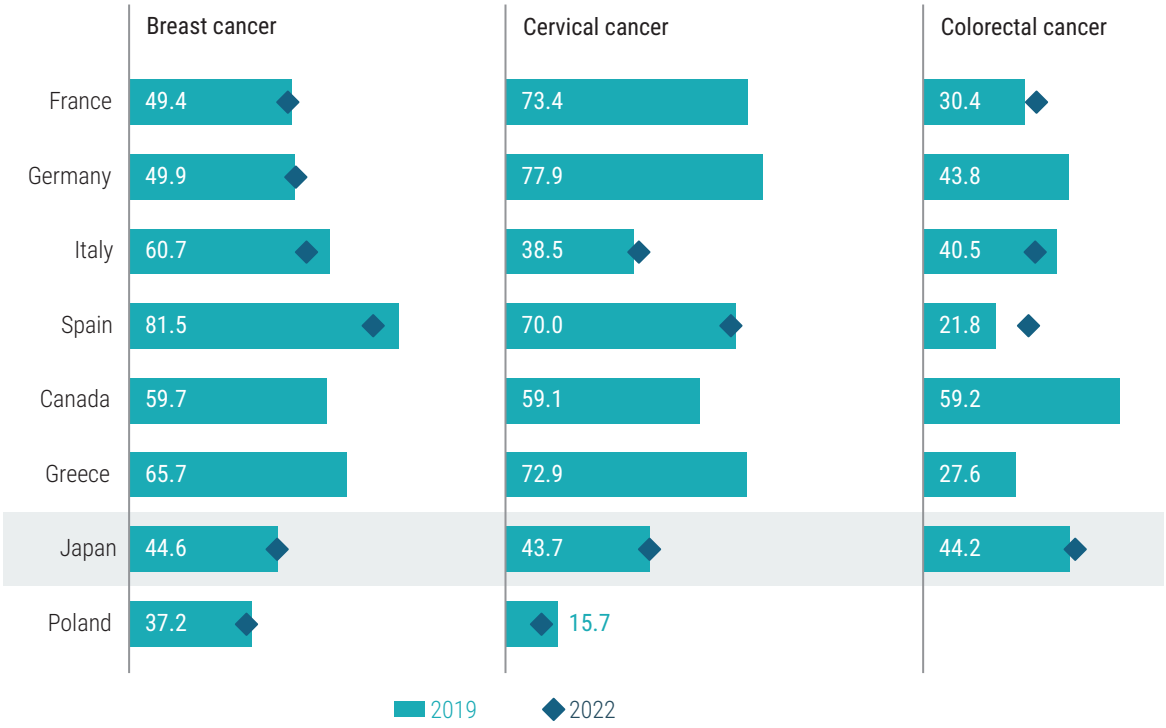
Despite its robust systems, Japan's risk assessment models face major modernisation and integration issues that reduce their effectiveness for complex patient groups and new risk assessment technologies. Several key challenges limit current risk assessment: progress in developing new methods like polygenic risk score (PRS) lags behind international standards; independent healthcare management and operations mean institutions use their own systems, making it difficult to compare risk assessment results across organisations; there is no established method for comprehensive risk assessment in patients with multiple conditions; while local governments recognise regional health disparities, only 12.8% of prefectures were aware of disparities caused by social factors such as income, education, and occupation according to a 2021 survey [136].

Subdomain 3.3: Screening

Cancer screening

Japan has implemented extensive population-wide screening programmes that provide systematic access to early detection services across various diseases, though participation gaps and implementation challenges hinder optimal uptake. Cancer screening occurs through two channels: workplace screenings for employees enrolled in Employee Health Insurance and community screenings for individuals with National Health Insurance coverage. However, screening participation remains below international standards. Figure 4 shows cancer screening rates across all PHSSR countries in scope for 2019 and 2022. Although access to modern screening technology is widely available, there are substantial disparities in coverage rates. In 2019, mammography screening rates for breast cancer among women aged 50–69 in Japan stood at 44.6%, compared to 81% in Spain [13]. When comparing cervical screening rates, Japan lagged most countries, with a

Figure 4. Cancer screening (percentage of those in specified age range), 2019 and 2022



Source: OECD (2023), Health at a Glance 2023: OECD Indicators, OECD Publishing, Paris.

43% coverage of eligible women, ahead only of Italy and Poland, with 38.5% and 15.7% coverage, respectively. Japan outperformed most countries in colorectal cancer screening with screening rates at 41.5%, second only to Canada, which managed 59.2% coverage among the eligible population. In 2022, rates for gastric cancer screening for those aged 40 and over reached 37.2%, alongside lung cancer screening rates of 45.0% [4].

Screening for cardiovascular and metabolic diseases

Cardiovascular and metabolic disease screening is conducted through Specific Health Checkups, with Employee Health and National Health Insurance providers offering enrolees standard examination items such as medical history, physical measurements, blood pressure checks, and blood tests (lipids and glucose), as well as risk assessments based on metabolic syndrome criteria such as urinalysis screening (urine protein) for CKD [34][137]. In the fiscal year 2022, the target population for Specific Health Checkups (ages 40–74) was approximately 51.92 million individuals, with around 30.17 million undergoing examinations, resulting in an implementation rate of 58.1% [3].

Screening for chronic respiratory disease screening

Chronic respiratory disease screening compares poorly to other NCD areas, with inadequate protocols for emerging screening technologies and incidental findings management. Screening is conducted via chest X-rays provided by insurers, although CT screenings are not typically part of standard practice. Additionally, no established protocol exists for managing incidental findings or respiratory diseases, such as interstitial lung diseases, detected during lung cancer CT screenings [137]. This limited approach hampers early detection of chronic respiratory conditions and highlights opportunities for enhancement based on existing screening programmes. In 2025, the National Cancer Center Japan recommended the use of low-dose CT (LDCT) for lung cancer screening among heavy smokers. Importantly, LDCT screening can also facilitate the early detection of non-malignant respiratory diseases, such as COPD, supporting earlier intervention for high-risk populations. National adoption of LDCT-based screening could therefore contribute to improved outcomes for both malignant and non-malignant respiratory diseases.

Quality challenges in screening implementation

Despite extensive screening programmes, Japan faces significant hurdles in evidence-based implementation, data utilisation, and quality assurance that limit its effectiveness. Notable challenges include: regional differences in Specific Health Checkups and cancer screening participation rates, which reached about 20–30 percentage points between prefectures in 2022 [4][138]; screening data retention managed by MHLW is limited to five years [139], which hampers lifelong health management and research potential; evaluating effectiveness and adopting new screening techniques (e.g., low-dose CT for high-risk lung cancer groups) demands considerable time; local government policies for screening implementation do not always match national guidelines, with 81.3% of local authorities conducting screenings that are not based on national guidelines in 2022 [140].

The prostate-specific antigen (PSA) test exemplifies these challenges: despite requiring careful benefit-harm balance consideration and international recommendations for patient-physician consultation [141], and despite not being recommended as systematic screening in Japan [142], 79.1% of local governments offered PSA testing in 2022 [140]. Similarly, cancer screening for elderly populations raises concerns about limited life expectancy benefits and unnecessary treatments, leading to recommendations against screening for those aged 65 and older or 76 and older in the United States and the United Kingdom [143]. In Japan, while national policy does not actively promote screenings for those over 70, some local governments encourage such screenings [144], highlighting the need for improved adherence to evidence-based guidelines.

Subdomain 3.4: Diagnosis and referral

Current state of the diagnostic system

Japan boasts a world-leading diagnostic infrastructure that offers widespread access to advanced medical technologies; however, regional disparities and coordination issues restrict the optimal use of these technologies across all population groups. Under Japan's universal health insurance system, access to advanced medical equipment and services such as CT, MRI, and PET scanners is among the highest across 38 OECD member countries [13]. Insurance covers advanced diagnostic methods, such as pathological diagnosis and genetic testing, alongside essential testing frameworks for personalised medicine, including cancer genome diagnostics and companion diagnostics. Moreover, artificial intelligence (AI)-enhanced imaging diagnostic support systems are being introduced to boost diagnostic accuracy and efficiency [145]. This technological sophistication provides a solid foundation for early detection; however, continued efforts are needed to further improve population-level health outcomes. For example, expanding access to genetic testing in oncology, including broader insurance coverage for gene panel testing, would facilitate earlier and more precise diagnosis, support the adoption of innovative therapies, and help standardise cancer care across regions.

Wait time for diagnosis

Japan lacks comprehensive national data on diagnostic wait times and emergency presentation patterns, which would allow for a systematic assessment of diagnostic system effectiveness. Improved data collection and analysis systems are crucial for evidence-based system optimisation. Cancer diagnosis reveals mixed patterns: the proportion of cases initially detected in emergency departments is not systematically tracked, while cancer staging data for 2020 shows varying rates of advanced disease at initial diagnosis, including breast cancer (female only) at 32.4%, liver cancer at 25.4%, prostate cancer at 30.8%, and gastric cancer at 36.6%. Lung cancer and colorectal cancer exhibit comparatively high rates at 56.6% and 47.3% respectively, suggesting tendencies for late-stage detection [146]. This finding underscores the need to evaluate the effectiveness of existing screening programmes to identify barriers and transferable lessons for improving early detection.

Challenges in referral and follow-up systems

Japan's diagnosis and referral systems encounter significant obstacles in standardisation and coordination, which hinder efficient care pathways and patient management. Key issues include inconsistent referral criteria from primary care to specialists, leading to variability in judgments across different medical institutions; cancer screening follow-up examination rates among those needing detailed assessments remain below the 90% target set by the Fourth Basic Plan to Promote Cancer Control Programmes [147]; regional disparities exist in the availability of specialists and technicians for advanced diagnostic tools [148]; and patients with multimorbidity often require visits to multiple specialised medical facilities, making inter-facility coordination difficult and complicating comprehensive, personalised care [55].

Subdomain 3.5: Secondary and tertiary prevention

Current status of treatment access

Patterns in treatment access reveal significant post-pandemic changes that require ongoing monitoring to determine long-term health impacts and the effectiveness of system utilisation. The COVID-19 pandemic led to a decrease in inpatient and outpatient visits; as of 2023, patient attendance has not returned to pre-pandemic levels, suggesting a change in patient health-seeking behaviour [149]. Maintaining ongoing and careful monitoring of how patients' care-seeking

behaviour impacts their health remains essential for comprehensive healthcare delivery planning and better targeting of primary preventative strategies.

Current status of cardiovascular and metabolic disease management

Japan shows mixed progress in managing cardiovascular and metabolic diseases, with some indicators improving while others decline. Data indicate that the average systolic blood pressure for people aged 40-89 decreased from 138 mmHg to 137 mmHg in men and from 133 mmHg to 131 mmHg in women between 2010 and 2018, reflecting a general downward trend over the ten-year period [14]. However, data from 2017–2018 revealed slight increases in systolic blood pressure among men and women aged 70 and older [14], highlighting the need for ongoing monitoring and targeted interventions.

Cholesterol management shows similar trends: among individuals aged 40–79, the percentage of men with total cholesterol levels of 240 mg/dL or higher increased from 13.8% in 2010 to 14.2% in 2019, while for women, it rose from 22.0% to 25.0%. LDL cholesterol levels of 160 mg/dl or higher also grew, from 8.3% to 9.8% for men and from 11.7% to 13.1% for women during the same period [14]. The prevalence of hypercholesterolemia remains stable or worsens in both genders [14], highlighting the need for more rigorous dyslipidaemia management strategies and better intervention effectiveness.

Diabetes management has shown positive trends but continues to face ongoing challenges. Despite glycaemic control (HbA1c ≧ 8.4%) decreasing from 1.2% in 2009 to 0.94% in 2019 [14], the proportion of individuals continuing diabetes treatment slightly increased from 63.7% in 2010 to 67.6% in 2019, but the change is not statistically significant [14]. The number of new dialysis patients due to diabetic nephropathy annually dropped from 16,247 in 2010 to 16,019 in 2019, though this did not meet the Health Japan 21 (The Second Term) target of 15,000 [14].

Provision of continuous care in the community

The delivery of emergency and rehabilitation services is quite effective in providing urgent care and recovery support. However, continuous improvement and enhanced coordination remain essential to improve health outcomes further. These services are modelled for integrated acute and recovery care delivery. Acute care performance in 2023 showed that the average nationwide time from the emergency call for cerebrovascular disease patients to initial transport to the emergency hospital was 44.7 minutes from onset [150]. Additionally, 2023 data showed early post-admission cerebrovascular rehabilitation (within 3 days) rates for inpatients aged 18 and over who suffered cerebral infarction reached 81.9% [15]. Transitioning from acute care to home-based care involves continuous community healthcare provision through treatment plans created in acute care hospitals, outlining patient journeys from acute care hospitals to recovery hospitals and ultimately home return. These plans are shared and utilised by all medical institutions involved in patient care, enabling efficient delivery of integrated healthcare service [151].

Challenges in preventive healthcare

Japan faces substantial structural challenges in implementing effective secondary and tertiary prevention, requiring comprehensive system reforms that address regional equity, integrated care, cost-effectiveness assessment, and population health literacy. The implementation of preventive healthcare is limited by several barriers, including significant regional variation in the availability of advanced medical services and specialists [152][153], which may necessitate long-distance travel or extended waiting periods for access to quality treatment depending on location; moreover, there is a lack of comprehensive epidemiological data on multimorbidity patients, leading to insufficient development of care guidelines [154]; current healthcare delivery systems are specialised by medical department and lack adequate frameworks for interdepartmental and interinstitutional collaboration needed to provide integrated care for patients with multiple conditions.

Additionally, no established system exists for accurately assessing the cost-effectiveness of preventive interventions, leading to delays in the dissemination of innovative medical technologies [155]. Delays in regulatory approval for drug pricing assessments are partly due to the separate healthcare and long-term care funding streams in Japan. This can prolong consensus-building processes needed to factor potential associated cost burden reductions into drug pricing [155]. Furthermore, developing solutions to improve public and patient health literacy and stimulate behavioural changes, such as enhancing lifestyle habits and improving medication adherence, remains essential for comprehensive prevention effectiveness.

Subdomain 3.6: Key findings, summary indicators and recommendations

KEY FINDINGS

- Clinical guidelines are thoroughly developed [112], and medical institutions constantly monitor adherence. However, there is no nationwide system to track compliance rates. Although some conditions, like diabetes, have guidelines that consider multimorbidity, the ageing population requires expanding these comprehensive guidelines to other diseases to improve care coordination.
- Specific Health Checkups are mandated for all citizens aged 40 and older; however, the 2022 participation rate reached only 58.1% [3]. Additionally, the MHLW management systems limit examination result retention to five years [139], requiring enhanced storage and accumulation of health data to promote the effectiveness of public health management and research utilisation.
- Cancer screening participation rates, such as mammography for breast cancer over two years among women aged 50–69, reached 44.6% in 2019, falling below the average among 32 OECD member countries [13]. This participation gap limits the effectiveness of early detection despite the availability of a comprehensive programme.
- Advanced diagnostic tools like CT, MRI, and PET are widely available, with the highest device-to-population ratio among 38 OECD countries in 2021 [13]; however, regional disparities remain evident [148]. While widespread screening and medical equipment help increase early cancer detection rates, lung cancer is frequently diagnosed at later stages [146]. Challenges include inconsistencies in referral criteria across institutions, inadequate follow-up for patients requiring detailed assessments, and poorly developed, coordinated care systems for individuals with multiple conditions.
- Indicators such as systolic blood pressure, poor glycaemic control, and new dialysis patient numbers show improving trends, yet LDL cholesterol levels and metabolic syndrome (including pre-stage) demonstrate worsening trajectories requiring enhanced management, particularly for diabetes and dyslipidaemia [14]. Challenges related to secondary and tertiary prevention include regional disparities in access to advanced medical care institutions and specialist availability, the development of a medical system for patients with multimorbidity, and the creation of mechanisms to evaluate the cost-effectiveness of preventive interventions, considering both medical and long-term care aspects.

KEY PERFORMANCE INDICATORS AND CURRENT MEASUREMENTS

- **Specific health checkups rate**: 58.1%(2022) [3] – This indicator reflects the coverage of the risk assessment system, with significant disparity among insurers, showing higher participation in Employee Health Insurance and lower participation in National Health Insurance.
- **Cancer screening rates**: Mammography for breast cancer at 44.6% (women aged 50-69, based on screening within past two years as of 2019) [13]; gastric cancer at 37.2% (individuals aged 40 and over, based on screening within past year as of 2022) [4]; colorectal cancer at 41.5% (individuals aged 40 and over, based on screening within past year as of 2022) [4]; lung cancer at 45.0% (individuals aged 40 and over, based on screening within past year as of 2022) [4].

- Cardiovascular and cardiac management indicators: Average systolic blood pressure (ages 40–89) of 137 mmHg for men (2018) and 131 mmHg for women (2018) [14]; proportion of individuals with total cholesterol levels of 240 mg/dl or higher (ages 40–79) at 14.2% for men (2019) and 25.0% for women (2019) [14]; proportion with LDL cholesterol of 160 mg/dl or higher (ages 40–79) at 9.8% for men (2019) and 13.1% for women (2019) [14]; rate of early post-admission cerebrovascular rehabilitation (within 3 days) for inpatients aged 18 and over with cerebral infarction at 81.9% (2023) [15].
- Diabetes management indicators: Proportion of individuals with poor glycaemic control (HbA1c ≧ 8.4%) at 0.94% (2019); annual number of new dialysis patients due to diabetic nephropathy at 16,019 (2019); proportion of individuals continuing diabetes treatment at 67.6% (2019); number of individuals with or at risk for metabolic syndrome at approximately 15.16 million (2019) [14].

INDICATORS TO BE DEVELOPED IN THE FUTURE

- Optimisation of screening indicators: Establish indicator systems evaluating integrated effects of multiple screening programmes, such as cancer screenings and Specific Health Checkups, their cost-effectiveness, disparities between incidence and mortality rates, balance of benefits against potential risks (such as false positives and overdiagnosis) from screenings, and impact on health disparities. Developing evaluation indicators to guide the introduction of new screening technology is particularly essential.
- Comprehensive evaluation of preventive healthcare indicators: Develop indicator systems that comprehensively evaluate the effects of secondary and tertiary prevention interventions, patient behaviour changes, and the economic impact on healthcare. Establishing evaluation methods to measure the effectiveness of preventive interventions for patients with multiple chronic diseases is particularly important.
- Comprehensive risk assessment indicators: Develop evaluation systems that can monitor health risk changes over a person's lifetime. Creating comprehensive risk assessment indicators is particularly crucial for effective long-term health management.
- Evaluation of diagnosis and referral systems indicators: Develop comprehensive indicators to evaluate the suitability of care pathways from primary to specialised care, waiting times, and the efficient utilisation of medical resources. Additionally, indicators that quantitatively assess regional healthcare access disparities and measure the effectiveness of improvement measures are crucial.
- Clinical guideline compliance evaluation indicators: Establish indicators that comprehensively evaluate medical institution guideline adherence based on size and regional characteristics, as well as their impact on medical outcomes. Developing indicators to assess the quality of integrated care for patients with multimorbidity is particularly important.

RECOMMENDATIONS

1. Enhancement of health and cancer screening rates: Intensify efforts to promote attendance among individuals eligible for Specific Health Checkups and cancer screenings, as well as those requiring detailed examinations, to encourage early detection and intervention. To address health disparities, consider non-attendee social and psychological characteristics, as well as past attendance behaviours, and explore personalised strategies for encouraging participation and follow-up.
2. Improvement and efficiency of preventive healthcare: Establish care delivery systems that emphasise improved control rates for chronic diseases, such as hypertension and diabetes. Develop and implement effective intervention programs that enhance medication adherence and promote lifestyle improvements. Accelerate preventive intervention cost-effectiveness evaluation and streamline new treatment inclusion in insurance coverage. Additionally, for preventive measures

such as screening tests, objectively assess the benefit-harm balance alongside cost-effectiveness and establish guidelines for recommended tests and target ages to enhance quality and efficiency.

3. Comprehensive approach to patients with multimorbidity: Develop systems that enable personalised treatment approaches for patients with multimorbidity. Promote the development and revision of clinical guidelines that accommodate individual treatment goals and methods, ensuring they are tailored to meet specific patient needs.

4. Inter-professional collaboration and outcome-based evaluation: Establish collaboration frameworks across specialties and institutions, provide reimbursement policy incentives, and develop primary care physicians skilled in managing patients with multimorbidity. Develop outcome-based evaluation systems supporting primary care physicians in providing comprehensive care.

5. Further promotion of regional healthcare collaboration: Promote specialisation and collaboration among medical institutions, creating systems that provide appropriate care throughout the entire patient journey (prevention, acute, chronic, and home care).

6. Incentives to drive innovation and digital solutions: Implement incentives, such as reimbursements, to promote telemedicine solutions, ensure nationwide implementation of the National Medical Information Platform and standard EMR systems, and facilitate information sharing across medical institutions.

7. Development of healthcare information infrastructure: Establish integrated platforms for health check-ups and medical data across insurers, enhancing individual health management and generating evidence for the prevention and management of NCDs. Standardise QI measurement, collection, and analysis to visualise healthcare quality and facilitate benchmarking among institutions, aiming for continuous improvement.

DOMAIN 4

Financing

Introduction

Japan's healthcare financing system faces significant challenges that could constrain NCD prevention and management despite having comprehensive universal coverage. Since implementing universal health insurance in 1961, all citizens have been legally required to enrol in public health insurance, enabling access to medical services with relatively low OOP expenses. However, after more than 60 years since the system was established, significant shifts in life expectancy and demographics require rethinking insurance structure and healthcare funding strategies to maintain its long-term viability. Rising public interest in the sustainability of the universal health insurance system reflects a growing awareness that traditional disease-focused and life-extension values must evolve toward a multifaceted recognition of healthcare values. This transformation emphasises the need to support patients in navigating illness – particularly chronic conditions – alongside the strategic utilisation of healthcare resources. The financing domain analysis reveals critical tensions between comprehensive coverage commitments and sustainable resource allocation, particularly for NCD prevention, where financial incentives often misalign with long-term health outcomes. These challenges require systematic reforms addressing prevention investment, outcome-based payment mechanisms, and diversified financing approaches to maintain Japan's healthcare system excellence while adapting to demographic and epidemiological changes.

Table 3: Key data on healthcare expenditures in Japan

Indicator	Past year	Latest year	Change
Healthcare expenditure by disease classification (100 million yen)	**2012 [163]**	**2022 [164]**	
Neoplasms/tumours:	38,120	49,692	+30%
Malignant neoplasms/tumours	33,267	43,661	+31%
Endocrine, nutritional, and metabolic diseases:	19,949	21,969	+10%
Diabetes	12,088	11,997	-1%
Cardiovascular diseases:	57,973	61,731	+6%
Hypertensive diseases	18,740	17,050	-9%
Heart diseases (excluding hypertensive)	17,351	21,693	+25%
Cerebrovascular diseases	17,772	18,142	+2%
Respiratory diseases:	21,507	22,234	+3%
Chronic obstructive pulmonary disease	1,410	1,370	-3%
Asthma	3,487	3,033	-13%
Healthcare expenditure (100 million yen)	**2012 [163]**	**2022 [164]**	
Japan	392,117	466,967	+19%
Healthcare expenditure (% of GDP)	**2012 [165]**	**2022 [120]**	
Japan	10.1	11.5	+14%
OECD average**	8.9	9.2	–
Healthcare expenditure per capita (USD PPP)	**2011 [166]**	**2022 [120]**	
Japan	3,213*	5,251	+63%
OECD average**	3,322	4,986	–
Household healthcare expenditure ratio (%)	**2011 [166]**	**2022 [120]**	
Japan	2.2	2.4	+9%
OECD average**	2.9	3.3	–

Notes:
* 2010 data.
** Percentage change not presented as OECD average based on 34 countries in 2011/12 and 38 countries in 2021/22.

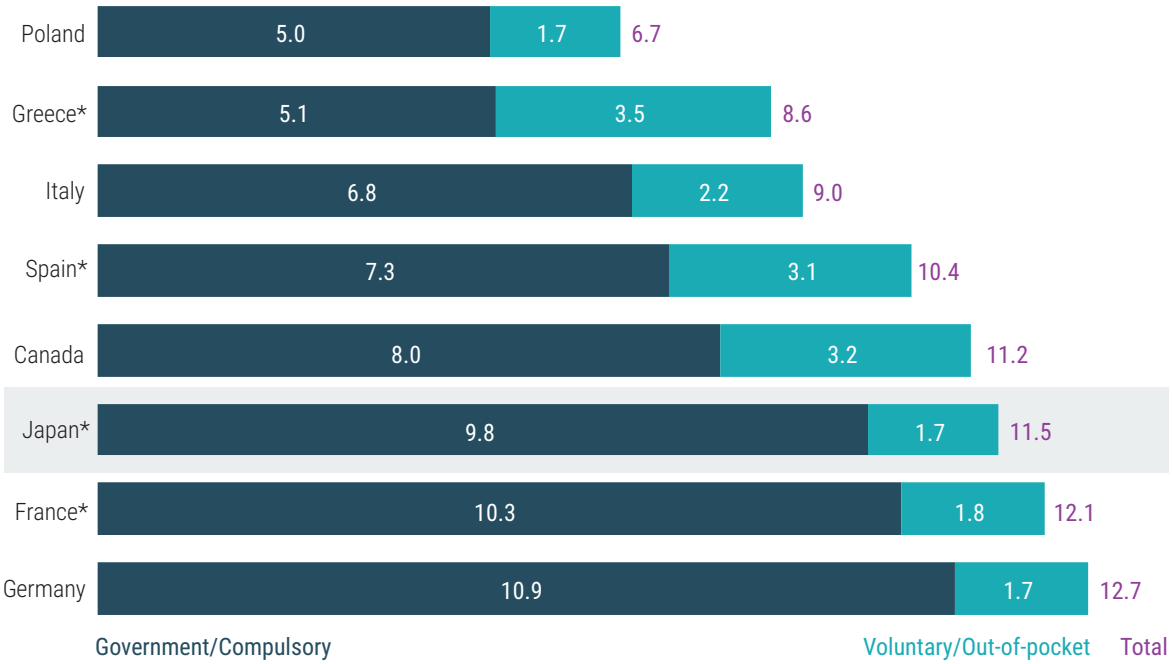
Subdomain 4.1: Health spending

Overview and trends in healthcare expenditure

Although healthcare spending growth exceeds international norms, a comprehensive rethinking of the country's funding framework is required if it is to balance fiscal sustainability thresholds while maintaining comprehensive NCD coverage. This process is especially urgent to ensure long-term healthcare access and requires coordinated policies to tackle demographic pressures and promote efficient resource allocation. According to the OECD's "Health at a Glance 2023", Japan's healthcare expenditure as a percentage of GDP reached 11.5% in 2022, significantly surpassing the OECD average of 9.2% across 38 member countries [13]. Figure 5 presents a breakdown of compulsory and OOP healthcare expenditure across the PHSSR countries in scope. Japan's healthcare spending ranks third after France (12.1%) and Germany (12.7%). Although Canada and Japan have similar overall expenditure levels at 11.2% and 11.5%, respectively, Japan's voluntary/OOP spending is only half of Canada's.

Additionally, Japan's per capita healthcare expenditure (USD PPP) in 2022 was USD 5,251, exceeding the OECD average of USD 4,986 among 38 member countries [13]. The MHLW's overview of national medical expenses indicates a dramatic increase from approximately 39.2 trillion yen in fiscal year 2012 to about 46.7 trillion yen in fiscal year 2022, marking a 19% over the ten-year period [156][157]. The primary driver remains the advancing population ageing, with the elderly population aged 65 and over increasing from 30.79 million in 2012 to 36.24 million in 2022, showing the highest growth rate compared to other age groups, according to the Ministry of Internal Affairs and Communications' population estimates [158][159]. This expenditure trend risks jeopardising the health system's sustainability and puts pressure on preventive investments at a time when demographic transitions demand expanded preventive approaches.

Figure 5. Government/compulsory and out-of-pocket healthcare expenditure as a share of GDP, 2022 (or nearest year)



Source: OECD (2023), Health at a Glance 2023: OECD Indicators, OECD Publishing, Paris.

Economic burden and disease burden of NCDs

Japan's substantial NCD-related healthcare expenditures highlight significant opportunities for prevention-focused investment strategies that could lower long-term costs while enhancing population health outcomes across various disease domains. Effective prevention investment requires a comprehensive understanding of current NCD economic burdens and evidence-based resource allocation to maximise prevention. In fiscal year 2022, healthcare expenditures for NCDs included: cardiovascular diseases accounting for JPY 6.1731 trillion (18.2% of total healthcare expenditure), neoplasms including cancer amounting to JPY 4.9692 trillion (14.7%), diabetes totalling JPY 1.1997 trillion (3.5%), and COPD reaching JPY 137 billion (0.4%) [157]. Over the past decade, healthcare costs for cardiovascular diseases increased from JPY 5.7973 trillion in fiscal year 2012, representing an approximately 1.06-fold rise, while expenditures for neoplasms, including cancer, grew from JPY 3.812 trillion, indicating a 1.30-fold increase [156][157]. Conversely, costs for diabetes decreased slightly from JPY 1.2088 trillion, and COPD expenditures declined marginally from JPY 141 billion [156][157].

A 2015 study by Japan's National Cancer Centre estimated that preventable risk factors contributed to about JPY 1.024 trillion in cancer-related economic costs [160]. Breaking down by risk, the infection-related burden was the highest at approximately JPY 478.8 billion, followed by active smoking at around JPY 434 billion, alcohol use at about JPY 172.1 billion, physical inactivity at roughly JPY 33.7 billion, and overweight at JPY 19 billion [160]. Certain risk factor and cancer type combinations, like Helicobacter pylori-caused gastric cancer (roughly JPY 211 billion) and lung cancer from smoking (about JPY 138.6 billion), showed especially high burdens [160]. These figures suggest that effective prevention could significantly reduce future healthcare costs; however, current insights into preventive healthcare spending are limited, which hinders proper resource allocation for prevention strategies based on expenditure data.

Budget formulation and management process

Analysing disease burden and effective prevention strategies is crucial for strategic resource allocation that maximises population health outcomes. To support evidence-based prevention investments, Japan's healthcare budgeting process could benefit from increased emphasis on epidemiological data and disease burden information, ensuring the best use of resources for NCD prevention. The process involves several steps: the MHLW drafts policy proposals and budget requests, which are reviewed by the Ministry of Finance; then, the Cabinet formulates the overall government budget; and finally, the National Diet deliberates and approves it. Budget allocations typically reflect the previous year's achievements and account for natural healthcare cost increases due to population ageing [161]. Since 2002, the Ministry of Finance has held annual "Budget Implementation Reviews" to improve fiscal resource efficiency by assessing the effectiveness of measures across ministries and identifying areas for improvement [162].

Current budget formulation processes could be enhanced to better address key factors for effective prevention investment. For example, centralised tracking of preventive healthcare spending could improve budgeting and management. Most national medical expenditure covers treatment costs under public health insurance, excluding preventive services like health screenings and vaccinations [167]. Moreover, legal frameworks for these services vary across regions, leading to different implementation bodies at local levels and within corporations, which complicates calculating total preventive health costs. These issues may impede efficient resource allocation for prevention, limiting evidence-based investments that could lower long-term health costs and improve population health outcomes.

Resource distribution and investment in prevention

Underinvestment in healthcare resources for prevention compared to treatment expenses can limit optimal NCD management and long-term health system sustainability. Enhanced resource allocation requires a thorough understanding of current spending patterns and strategic

adjustments towards prevention and early intervention, which can bring benefits to population health. An analysis of Japan's healthcare system reveals notable imbalances between funding for treatment and prevention. The absence of comprehensive tracking of preventive healthcare costs hampers accurate evaluation of prevention investment relative to treatment spending. Nonetheless, evidence indicates significant underinvestment in prevention strategies. Effective prevention investment involves identifying impactful prevention measures and allocating sufficient resources to maximise population health benefits while reducing future treatment cost pressures.

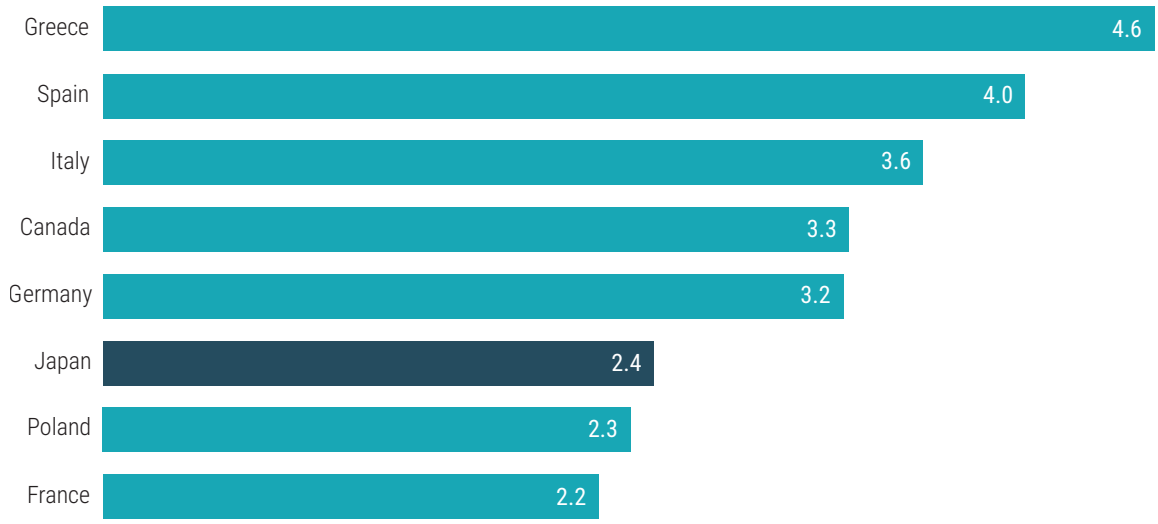
Subdomain 4.2: Coverage and financial barriers

Scope of coverage, trends in out-of-pocket expenses and financial barriers

Despite Japan's extensive universal health coverage, increasing cost-sharing requirements can create barriers that disproportionately affect vulnerable populations and hinder access to preventive care. Japan's "universal health insurance" coverage requires all citizens to enrol in public health insurance, whereby medical services approved by the MHLW receive insurance coverage regardless of the type of public insurance. Patients usually pay only a fraction (typically 30%) of their medical costs out-of-pocket (OOP), with the High-Cost Medical Expense Benefit System ensuring that their expenses for costly treatments do not surpass certain limits.

The OECD's "Health at a Glance 2023" report shows that in 2021, OOP spending on healthcare as a share of final household consumption in Japan was 2.4%, lower than the OECD average of 3.3% among 38 member countries [13]. Figure 6 presents the share of household consumption spent on healthcare across all the PHSSR countries in scope. The data not only offers an overall assessment of the financial burden of OOP expenditure but also highlights significant disparities. Data for 2021 ranks Japan (2.4%) third after Poland (2.3%) and France (2.4%). This is a stark contrast with Spain and Greece, where 4.0% and 4.6% of total household spending was on healthcare goods and services, nearly twice that of Japan. However, this relatively low level of international OOP expenses conceals significant individual financial burdens that can create barriers to access, especially affecting young patients and the utilisation of preventive care. The share of costs patients pay out-of-pocket under Japan's public health insurance system has gradually increased, with the burden on the working-age population (under 70 years old) rising from 20% in fiscal year 2002 to 30% in fiscal year 2006, and for patients aged 70–74, increasing from 10% to 20% in fiscal year 2008.

Figure 6. Out-of-pocket spending on health as a share of final household consumption, 2021 (or nearest year)



Source: OECD (2023), Health at a Glance 2023: OECD Indicators, OECD Publishing, Paris.

Economic barriers caused by medical expenses remain significant despite universal coverage. A 2023 patient experience survey conducted by the National Cancer Centre Japan involving 13,188 cancer patients showed that only 1.8% had to alter or discontinue treatment due to financial burdens, yet 24.2% reported that the financial strain of medical care had affected their lives [16]. Economic hardship was especially evident among young cancer patients (ages 18–39), with 44.9% reporting financial impacts, compared to 23.7% among older cancer patients (aged 40 and above) [16]. These findings indicate that young cancer patients may encounter greater economic barriers than other age groups, which could limit their access to other NCD prevention services and treatments.

Financial protection mechanisms to mitigate economic barriers

Japan has adopted extensive burden-reduction measures that offer substantial financial protection; however, restrictions in coverage scope and eligibility conditions limit comprehensive strategies for preventing and managing NCDs. Japan's financial protection is delivered through multiple mechanisms that address various aspects of healthcare costs. The high-cost medical expense benefit system reimburses patients when their monthly OOP expenses surpass certain maximums [168]. This cap varies based on age and income level; for example, as of February 2025, enrolees under 70 with annual income of around JPY 3.7 to 7.7 million have a monthly OOP maximum set at "JPY 80,100 + (total medical costs − JPY 267,000) × 1%" [12].

Additional measures include further reductions for those who reach the maximum three or more times within 12 months (frequent cases) or when household medical expenses combined exceed the cap (household aggregation). Local governments provide additional financial support, including cancer care subsidies that cover expenses related to hepatitis B or C virus-induced liver cancer treatment or prosthetics purchases (such as artificial breasts) for mastectomy patients [169]. Although these measures offer significant protection, further discussions are underway to revise financial burdens to control rising social security costs, such as increasing the caps on National Health Insurance premiums and considering higher maximum OOP expenses under the High-Cost Medical Expense Benefit System [170]. These potential changes could worsen financial barriers that limit access to NCD prevention and treatment, especially for vulnerable populations. Despite a comprehensive national coverage system providing a robust foundation for NCD care, further efforts are needed to address emerging gaps and barriers that hinder optimal prevention and treatment due to associated treatment costs.

Subdomain 4.3: Financial incentives

Payment systems for integrated and coordinated care

Improved payment system design is essential for aligning financial incentives with population health goals and sustainable management of NCDs. To support primary care doctors in providing comprehensive care for NCD patients, Japan's medical fee system includes various evaluation components that facilitate integrated care. These include lifestyle disease management fees and specific treatment management fees, which are calculated to support comprehensive care, including medication, nutrition, exercise, and rest, for conditions like dyslipidaemia, hypertension, diabetes, and other conditions such as cancer, cardiovascular diseases, asthma, and COPD [171]. By incorporating evaluations for holistic care into the fee structure, this system encourages doctors to deliver coordinated, integrated care. However, it also highlights the need for further improvements to promote prevention and outcome-based payments.

Incentive structure for optimising screening and disease prevention

Japan has established distinct economic incentives for key stakeholders to encourage preventive healthcare. However, a primarily quantitative approach and limited outcome assessment hinder achieving the best prevention results and health improvements. By fiscal year 2008, all healthcare insurers were legally required to conduct targeted Health Checkups and guidance for individuals aged 40–74, focusing on metabolic syndrome [172]. For the National Health Insurance managed by prefectures and local governments, the government assesses the implementation of health exams, cancer screenings, smoking cessation programs, severe disease prevention strategies, and efforts to motivate insured individuals to participate in preventive activities and follow medical advice. Financial support is allocated based on evaluations through the Insurer Effort Support System [173]. Similarly, Employee Health insurers, such as Health Insurance Societies and Mutual Aid Associations, adjust financial assistance for medical care for those aged 75 and above according to similar performance metrics [174].

However, these insurer incentive systems mainly emphasise quantitative metrics like Specific Health Checkup rates and guidance adherence, which may underemphasise qualitative outcomes such as health improvements and disease prevention. As a result, insurer efforts often become superficial, focusing on meeting targets rather than genuine health outcomes, which can undermine the effectiveness of the preventive health programs. For insured individuals, each insurer offers distinct preventive and health promotion initiatives. These include awarding points for activities like walking campaigns through smartphone apps and daily exercise, which can be redeemed for health products or discounts on comprehensive medical checkups like the 'Ningen Dock' [175].

Provider incentives and outcome-based payment approaches

Implementing provider incentive designs that link performance-based payments to health outcomes is essential for improving comprehensive NCD management. For instance, the UK employs the Quality and Outcomes Framework (QOF), which evaluates general practitioners based on outcome indicators, such as disease control, with payments linked accordingly [176]. In contrast, Japan's provider payment systems show limited advancement towards outcome-based incentives, particularly in lifestyle disease prevention. Current pay structures offer little recognition for prevention and early detection efforts and place insufficient focus on clinical outcomes, which may hinder the development of effective preventive management systems.

Furthermore, concerns have been raised about the recommended age for cancer screening, with many countries generally not endorsing screenings for individuals over 70. Japan's guidelines suggest an upper age limit of 69 for recommending cancer screenings, yet in practice, screening is provided to those over 70 [144]. For older populations, cancer detection may have little impact on life expectancy or could result in unnecessary treatment, indicating that excessive screening might cause more harm than good. From the standpoint of making the best use of limited healthcare resources, re-evaluating screening policies, such as setting upper age limits for cancer screening, seems necessary to improve cost-effectiveness and optimise resource allocation. Although Japan's medical fee system establishes prevention incentives and outcome-based payment mechanisms, further efforts are required to optimise integrated NCD management and deliver comprehensive care that promotes long-term health improvements.

Subdomain 4.4: Key findings, summary indicators and recommendations

KEY FINDINGS

- Healthcare expenditure growth exceeds sustainable levels with limited prevention investment. As of 2022, Japan's healthcare spending – both as a percentage of GDP (11.5%) and per capita (USD 5,251) – exceeds the OECD average for its 38 member countries (9.2%, USD 4,986) [13], reflecting an increasing trend in healthcare costs globally.

- Strategic investments in preventive strategies could reduce NCD-associated costs. NCDs significantly strain healthcare finances, with preventable cancer risk factors costing about JPY 1.024 trillion in 2015 [160]. Infectious diseases, smoking, and alcohol consumption account for significant costs (roughly JPY 478.8 billion, 434 billion, and 172.1 billion, respectively) [160], indicating that prevention could reduce costs. Yet, limited knowledge about preventive health spending hampers evidence-based strategic investments.
- Financial barriers create disproportionate access constraints for vulnerable populations. The effect of OOP medical costs on daily life is significant. A 2023 national survey found that approximately 24.2% of cancer patients reported that financial burdens affected their daily activities [16]. For young adult cancer patients, this percentage increases to 44.9%, suggesting that younger individuals face greater economic challenges [16]. The financial strain related to medical expenses raises important concerns, as it can create disparities in accessing proper treatment, especially in prevention and early intervention efforts.
- Payment incentives inadequately address prevention and outcome-based performance. In the current medical reimbursement system, the evaluation of prevention and early detection initiatives is often inadequate, particularly in terms of health outcome-based evaluation indicators and reimbursement frameworks. For example, insurers often focus on quantitative metrics, such as health checkup rates, which can divert attention from the primary goal of improving health outcomes. The absence of assessment and reimbursement strategies centred on clinical outcomes can hinder the development of effective preventive management systems, thereby limiting the efficiency of NCD prevention and treatment.

KEY PERFORMANCE INDICATORS AND CURRENT MEASUREMENTS

- **Healthcare expenditure as percentage of GPD**: 11.5% (2022) [13] – This key indicator shows the proportion of healthcare spending relative to GDP, exceeding the OECD average of 9.2% across 38 countries [13].
- **Healthcare expenditure per capita**: USD 5,251 (2022) [13] – This indicator reflects healthcare expenditure per person, higher than the OECD average of USD 4,986 across 38 countries [13].
- **Household healthcare expenditure ratio**: 2.4% (2021) [13] – This indicates the proportion of household expenditure allocated to healthcare costs, which is lower than the OECD average of 3.3% across 38 countries [13].
- **Percentage of impact on living standards due to medical expenses**: 24.2% (2023) [16] – This indicates the proportion of patients (specifically cancer patients) who reported that treatment costs affected their daily lives, serving as an indicator of barriers to healthcare access due to economic reasons.

INDICATORS TO BE DEVELOPED IN THE FUTURE

- **Comprehensive indicators for preventive healthcare expenditure**: Accurate categorisation of preventive healthcare spending is essential, from primary to tertiary prevention. Currently, overall expenditure is unclear due to complex regulations and fragmented organisations. Understanding actual spending, particularly on services outside public insurance, is crucial for making informed strategic investments and optimising resource utilisation.
- **Cost-effectiveness indicators for preventive healthcare**: Develop indicators to measure the return on investment for each preventive measure, such as its impact on reducing medical costs or increasing healthy life expectancy. For example, quantifying the cost savings from preventing lifestyle-related diseases is crucial for demonstrating the benefits of preventive healthcare and informing resource allocation decisions.

- Qualitative evaluation indicators for preventive healthcare: Create indicators to assess how medical institutions and insurers deliver preventive and health management services, as well as the health outcomes and lifestyle improvements patients achieve through these interventions. It is critical to develop outcome-based evaluation indicators that link preventive measures to tangible health improvements.
- Equity evaluation indicators for healthcare expenditure burden: Develop indicator systems to measure regional and income-related differences in economic access to preventive healthcare, promoting equitable access among diverse population groups. These indicators should evaluate disparities in healthcare access caused by economic barriers, including factors such as healthcare service utilisation rates by income level, the uptake of elective preventive health services, and the actual financial burden of healthcare costs.

RECOMMENDATIONS

1. Establishment of evidence-based healthcare policy formulation processes: Create integrated systems to record preventive healthcare costs and assess their effectiveness. This will facilitate strategic resource allocation to effective preventive measures, ensuring limited financial resources are used efficiently while maximising the health benefits for the population.
2. Introduction of outcome-based evaluation systems: Implement evaluation systems that focus on health outcomes to measure the efforts of medical institutions in preventive care and early detection. In addition to the existing fee-for-service reimbursement for procedures, consider introducing reward systems tied to treatment outcomes for conditions like diabetes and hypertension, which can now be monitored continuously with tools such as wearable devices.
3. Optimisation of healthcare finances including new revenue sources: Implement reforms to enhance cost efficiency and secure funding for health system sustainability. This includes revising insurance benefits, preventing disease, and reducing unnecessary tests as part of national efforts to optimise healthcare spending. To ensure stable funding, balance taxes, premiums, and OOP costs, while considering reforms such as tax policies and patient co-payments, especially given limits on social insurance premium increases (see Figure 7 below).
4. Improvement in access to preventive healthcare: Address health disparities caused by economic and geographical barriers by enhancing public subsidy systems for affordable preventive healthcare. This approach aims to prevent individuals from delaying health services due to financial reasons. Develop comprehensive support systems that ensure equitable access to preventive healthcare across the country, including efforts to reduce regional disparities and financial barriers that hinder effective NCD prevention and early intervention for diverse populations.

Figure 7 illustrates examples of measures aimed at optimising healthcare finances, including securing new financial resources. The proposed measures are organised around four perspectives: (A) Optimising healthcare demand, (B) Stabilising the healthcare delivery system, (C) Balancing the burden and benefits of healthcare costs, and (D) Establishing governance structures and processes for consensus building.

Figure 7. Examples of measures to enhance the sustainability and resilience of the healthcare system

Notes: LTCB = Long-term care benefit, HIB = Health insurance benefit, Doctor-to-patient with nurse = online consultation with a doctor when a nurse is present, DPC = Diagnosis Procedure Combination, HCMEB = High-cost medical expense benefit, * services without scientific evidence of effectiveness.

DOMAIN 5

Workforce

Introduction

Workforce limitations can create systemic bottlenecks that hinder effective NCD management across prevention, diagnosis, and treatment domains. Despite a sophisticated healthcare infrastructure, Japan's healthcare workforce faces several challenges that may constrain its ability to deliver optimal early intervention and prevention of NCDs. The predominantly private healthcare delivery model – with approximately 80% of hospitals and 90% of clinics operating as private medical institutions [177] – requires coordinated government guidance for workforce optimisation and regional deployment [178]. To ensure the appropriate distribution of healthcare professionals across diverse regional contexts, Japan must strategically address both quantitative shortages and qualitative capability gaps. Understanding these workforce dynamics is essential for developing sustainable NCD prevention strategies that can address Japan's ageing population while managing evolving disease patterns and leveraging technological capabilities.

Table 4. Key data on Japan's workforce

Indicator: workforce number	2011 [120]	2021 [120]	Change
Physicians (per 1,000 population)			
Japan	2.3	2.6	+13%
OECD average*	3.2	3.7	+16%
Nurses (per 1,000 population)			
Japan	10.5	12.1	+15%
OECD average*	8.2	9.2	+12%
Indicator: regional disparity in physicians	**2012 [186]**	**2022 [187]**	
Prefecture with fewest physicians (per 1,000 population)	1.5	1.8	
Prefecture with most physicians (per 1,000 population)	3.0	3.4	
Difference	+100%	+86%	
Indicator: regional disparity in nurses	**data not available**	**2022 [188]**	
Prefecture with fewest nurses (per 1,000 population)	–	9.5	
Prefecture with most nurses (per 1,000 population)	–	22.1	
Difference	–	+133%	

Notes: .
* Average values in 37 OECD countries.
Regional disparity in nurses data include registered nurses, public health nurses, midwives, and licensed practical nurses.

Subdomain 5.1: Workforce supply

Supply and demand of healthcare professionals

The physician supply limitations in Japan could potentially hinder the health system's ability to deliver comprehensive NCD prevention and early intervention services across diverse geographic and specialty domains. International comparisons reveal significant supply gaps which call for strategic interventions to mitigate the impact on population health outcomes. At 2.6 physicians per 1,000 population in 2021, Japan falls significantly below the OECD average of 3.7 across 38 member countries [13]. This shortage becomes particularly acute when examining urban-rural disparities:

urban areas maintain 2.6 physicians per 1,000 compared to the 14-country OECD average of 4.5, while rural areas show 2.9 physicians against an average of 3.2 [13]. These supply constraints limit the delivery of comprehensive preventive care, access to specialist consultations, and the management of NCDs through multidisciplinary intervention approaches.

Although promising, current workforce supply strategies may not scale effectively to meet the country's broader needs or address regional disparities comprehensively. Since 2008, regional quota medical school admissions and phased increases in admissions have generated approximately 3,500–4,000 new physicians annually nationwide, resulting in a total of 343,275 physicians by 2022 (76.4% male, 23.6% female) [17][179]. The Physician Supply-Demand Subcommittee projects a supply-demand balance of an under 60-hour workweek limit by 2029 or under 55-hour limit by 2032 [180]. However, these national projections conceal ongoing regional and specialty disparities that require targeted interventions beyond simply increasing overall supply.

Supply and demand of nursing professionals

A strong nursing workforce is crucial for community-based NCD prevention and management, especially for vulnerable populations needing home-based care services. Although current numbers are adequate, future demand increases could lead to a significant shortage, resulting in gaps in prevention and care services. The number of nursing professionals grew from 834,000 in 1990 to 1.734 million in 2020, reaching 12.1 nurses per 1,000 people in 2021, exceeding the OECD average of 9.2 across 37 member countries [13][18]. However, the Eighth Nursing Staff Supply and Demand Projections predict shortages of 60,000–270,000 nurses by 2025 as the first baby boom generation turns 75 [181]. Supply estimates range from 1.75 to 1.82 million, while demand could reach 1.88 to 2.02 million, taking into account the effects of work style reform [181].

Home nursing services face severe shortages, which could negatively impact the effectiveness of community-based NCD management. In 2021, the demand-to-supply ratio was 3.2 for home-visit nursing, compared to 1.8 in hospitals with fewer than 200 beds and 1.4 in hospitals with 200–400 beds [18]. These shortages directly undermine community-based chronic disease management and preventive care essential for effective NCD interventions.

Regional disparities in healthcare professionals

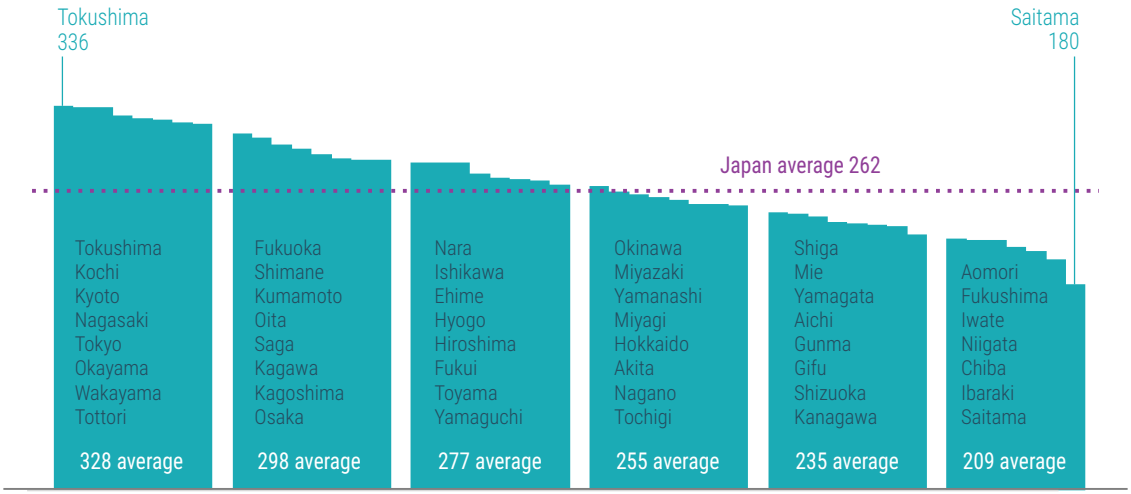
Persistent geographic workforce disparities create fundamental inequities in access to NCD prevention and early intervention, requiring comprehensive redistribution strategies beyond current incremental measures.

Regional physician disparities (see Figure 8) remain significant despite efforts to improve with 2022 data showing a 80% difference between the highest availability (3.4 per 1,000 in Tokushima Prefecture) and the lowest (1.8 per 1,000 in Saitama Prefecture) [17][187]. Redistribution of young physicians shows promising trends, with 27.8% increases in regions with shortages compared to 4.6% increases in well-resourced areas from 2012–2022 [19]. However, these improvements mainly benefit young physicians, while mid-career and senior physician imbalances persist, hindering comprehensive specialist care and mentorship in underserved regions. Moreover, these disparities particularly impact rural and underserved populations who face higher NCD risk factors and limited healthcare access.

Urban areas exhibit significant nursing disparities, with Saitama Prefecture (9.47 per 1,000), Chiba Prefecture (9.0 per 1,000), and Kanagawa Prefecture (9.5 per 1,000) falling below the national average of 13.3 [188].

Several policies have been enacted as part of redistribution efforts to ensure that workforce strategies comprehensively and effectively address the challenges in service delivery. Among these are the 2018 Medical Care Act and Medical Practitioners Act amendments, which enable prefectural physician supply planning through collaboration with the MHLW and universities [185]. Other

Figure 8. Regional disparities in practising physicians, 2022



Prefectures ranked (and grouped) by number of practising physicians per 100,000 population

Source: [187]. Table 2–42.

initiatives include regional quota medical school admissions, scholarships requiring specified regional service, allocation of clinical training slots, and recognition systems for physicians completing service in shortage areas [189]. Additional measures under consideration include enhanced reimbursements for shortage areas, financial support for medical equipment, and strengthened physician dispatch systems from regional core hospitals [190]. However, these measures require integration with comprehensive regional development strategies that address living conditions, family support, and professional development opportunities to ensure the long-term effectiveness of workforce retention. The utilisation of telemedicine, including remote home consultations, imaging interpretation, and pathology diagnostics, offers additional potential to optimise limited human resources across regions. These technologies can support local care delivery systems by facilitating access to specialist expertise without requiring physical transfer of patients or providers.

Initiatives for building a sustainable healthcare delivery system

As part of its efforts to address demographic transitions and evolving healthcare demands, Japan's comprehensive healthcare delivery reforms provide frameworks for optimising its workforce. The "three-in-one reform" approach demonstrates integrated policy thinking essential for sustainable workforce development and deployment strategies. The "Honebuto Policy 2019" established three integrated reform components: optimising regional medical institution functions and promoting collaboration; improving working conditions for physicians and healthcare workers; and advancing effective measures to address physician distribution imbalances [182]. Hospital bed requirement estimates across 339 medical service areas by function (advanced acute, acute, recovery, chronic care) aim to optimise regional institutional functional allocation in preparation for increased 2025 medical demand [183]. Looking toward the 2040s, with a significant population increase aged 85 and over, new regional healthcare visions focusing on medical institution collaboration, reorganisation, and consolidation will be developed and implemented from 2026 [184].

Employment support initiatives targeting the life stage needs of healthcare professionals demonstrate comprehensive workforce retention strategies. The MHLW programmes prevent female doctors and nurses from resigning by supporting their return to work through in-house childcare facilities, the introduction of re-employment in medical institutions, and work-family balance consultation services [191][192]. These initiatives recognise that sustainable workforce development requires addressing career-long professional needs rather than focusing solely on

initial recruitment and training effectiveness. In parallel, the strategic use of digital technologies – such as AI-supported medical documentation, remote consultations, and shared care records – is gaining attention as a means to improve operational efficiency and address regional workforce shortages. These tools can reduce non-clinical workload and enable more flexible deployment of healthcare professionals, particularly in underserved areas.

Subdomain 5.2: Training and workforce development

Development of the physician specialist system

Japan has developed advanced training systems that guarantee high-quality clinical education. However, development of the primary care workforce, vital for effective NCD prevention and early intervention, falls behind other specialties. This focus on specialists may create significant gaps in community-based prevention and integrated care. Since its launch in 2018, the Japan Medical Specialty Board's certification system designates 19 “basic areas”, including internal medicine, surgery, and paediatrics, with “sub-specialty areas” offering advanced expertise (such as cardiology or gastroenterology) through a two-tier structure for developing and assessing physician skills [128]. After a two-year clinical training following the National Medical Examination, physicians must complete at least three years of specialty training to qualify as basic area specialists. The process involves primary assessments by professional societies and secondary verification by the Japan Medical Specialty Board. To renew certification every five years, doctors need to demonstrate clinical achievements, participate in safety and ethics courses, and stay updated with area-specific knowledge [128].

Despite recognising its importance, primary care workforce development remains inadequate for optimal NCD prevention. The General Practice Physician system, launched in 2018 to provide holistic care regardless of specialty or disease, had only 311 qualified doctors by 2023 – insufficient for effectively addressing NCD prevention efforts [20][194]. This is especially worrying in ageing populations, where rising multimorbidity demands more comprehensive healthcare. Training programmes focus on practical experience in community health, internal medicine, paediatrics, and emergency medicine, with mandatory training in areas with limited medical resources [194]. Challenges to uptake include low awareness and understanding of general practice, shortages of supervising physicians with General Practice Physician qualifications, and limited interaction with role models, which disincentivise young doctors from pursuing career pathways in this field [195][196].

Primary care training and challenges for early NCD intervention

The Primary Care Function Reporting System, launched in April 2025, offers broad visibility into primary care capabilities. However, it lacks comprehensive quality assurance mechanisms necessary for effective NCD prevention and management. This reporting system supports patient selection across medical institutions but does not ensure service quality or effectiveness. Medical institutions report their primary care functions to prefectures, including managing major diseases, providing after-hours care, supporting hospital admissions and discharges, and coordinating home healthcare and caregiving services [197]. Prefectures review these reports to develop regional healthcare expansion strategies and disseminate public information. While the system helps patients select medical institutions with primary care capabilities and encourages regional healthcare provider differentiation and collaboration, it only visualises primary care functions without directly assessing or guaranteeing the quality of individual institutions' primary care, limiting its overall effectiveness for comprehensive NCD prevention and quality assurance.

Current status and challenges of the training system for nurses in specified acts

Japan's nursing specialist training initiatives demonstrate policy commitments to improving nursing capabilities; however, such initiatives face significant barriers to implementation and workplace utilisation that limit their effectiveness in enhancing NCD prevention and management services. The Specified Acts training system, implemented since October 2015, covers 38 specific procedures requiring specialised knowledge and skills when performed by nurses, based on protocols [198][199]. Training aims to promote team-based healthcare and home healthcare through nurses capable of performing these specified tasks [198][200]. Comprehensive training includes clinical pathophysiology, clinical reasoning, physical assessment, clinical pharmacology, and healthcare safety, as well as specific category subjects such as airway management, mechanical ventilation, nutritional catheter management, and blood glucose control, including medication administration [201][202]. Completion of this training can also broaden the scope for nurses to respond more promptly to changes in patient condition, potentially enhancing early intervention efforts in NCD management.

The training programme outcomes highlight significant implementation challenges. By March 2025, 11,840 nurses had completed training, which is far below the target of 100,000 set for 2025 [21][191]. Disparities in regional training opportunities greatly affect progress, with Tokyo offering 39 designated training facilities, whereas many prefectures have only one or two [204]. Additional obstacles include difficulties in staff replacement during training and the substantial financial costs associated with this process [205]. Notably, 31.6% of trained personnel have not engaged in any specified acts at their workplace over the past year [205]. Barriers within workplaces, such as inadequate infrastructure for practising these acts and a lack of protocols, further hinder utilisation [193][205], indicating that completing training alone does not automatically improve patient care without sufficient workplace support systems.

Training system and challenges for promoting task shifting and sharing

Initiatives focused on task shifting, sharing, and digital health integration are crucial for managing workforce shortages and optimising workforce utilisation. Such technological advancements could maintain the quality of care and provide an opportunity to expand service access capabilities. The introduction of physician overtime work regulations in April 2024 prompted regulatory bodies to assess how tasks are allocated among healthcare professionals [206]. Priority task shifting encompasses a wide range of activities that staff can undertake, including explaining procedures to patients, taking initial medical histories, and assisting with document preparation. Expanding the use of professional expertise involves nurses assisting with medical procedures, pharmacists recommending prescriptions and advising on medications, radiologic technologists interpreting imaging studies, clinical laboratory technologists assessing test results, and physical therapists developing rehabilitation plans.

Implementing task shifting and sharing faces significant barriers that must be systematically addressed for it to be fully effective. Challenges include a limited number of medical institutions engaging in such initiatives, low patient awareness about task shifting, delays in education and training for those receiving tasks, and difficulty in securing personnel [207]. Widespread adoption remains limited, highlighting the need for objective indicators to visualise progress in task transfer and to prioritise tasks based on hospital size and regional factors. Improvements in AI and ICT efficiency offer vital alternatives to mitigate workforce shortages, especially in document preparation tasks that lead to overtime for physicians (57.1%) and nurses (57.9%) [208]. Future priorities should focus on adopting AI-driven document creation tools and fostering effective digital collaboration with external partners such as insurers and educational institutions, which require strategic planning and implementation support. Additionally, ICT-based support systems – such as shared digital care platforms and remote supervision frameworks – have the potential to enable central hospitals to assist smaller facilities in real time, reinforcing regional care capacity without requiring staff relocation.

Subdomain 5.3: Key findings, summary indicators and recommendations

KEY FINDINGS

- The shortage of physicians hampers comprehensive NCD prevention despite the anticipated national balance. While a nationwide physician supply-demand equilibrium is expected by 2029, regional and specialty disparities persist [180]. Progress in reducing regional disparities among young physicians contrasts with continued imbalances among mid-career and senior physicians [19].
- Nursing shortages threaten community-based NCD management effectiveness. Projected shortages of 60,000 to 270,000 nurses by 2025 will notably impact home nursing care, especially in urban areas [18][181]. The slow rollout of the specified acts training system impedes the promotion of task sharing and shifting [21][203].
- The development of the primary care workforce does not adequately meet the needs for NCD prevention. While established systems ensure quality, safety, and ongoing professional growth for specialists, training for primary care staff, critical for tackling NCDS, remains lacking [128]. There is a need for significantly more general practice physicians to improve comprehensive healthcare services, especially for ageing populations [20][193].

KEY PERFORMANCE INDICATORS AND CURRENT MEASUREMENTS

- **Number of physicians per 1,000 population**: 2.6 (2021) – This number, which is a crucial indicator of health system service delivery, remains below the OECD average of 3.7 among 38 member countries, indicating healthcare access limitations [13].
- **Degree of regional disparity in physicians**: up to 1.8 times (2022): The ratio between the maximum (335.7 per 100,000 population in Tokushima Prefecture) and minimum (180.2 per 100,000 population in Saitama Prefecture) physician numbers highlights regional disparities in healthcare access [17].
- **Number of nurses per 1,000 population**: 12.1 (2021), **job offer ratio in visiting nursing sector**: 3.2 (2021) – Indicators of adequacy in healthcare and nursing services show that, although Japan's nurse density exceeds the OECD average of 9.2 among 37 member countries, shortages still exist in urban areas and the home nursing sector.
- **Improvement rate in regional disparity of young physicians**: +27.8% in regions with fewer physicians (2012–2022) – The growth rate indicator for physicians under 35 shows a 27.8% increase in regions with fewer physicians, compared to a 4.6% increase in regions with more physicians. This highlights the effectiveness of the regional disparity measures [19].
- **Primary care system development status**: 311 general practice physicians (2023), 11,840 nurses completed specified acts training (2025) – Status indicators showing the numbers of healthcare professionals crucial for NCD countermeasures [20][21].

INDICATORS TO BE DEVELOPED IN THE FUTURE

- **Quality evaluation indicators for primary care**: Indicators evaluating the effectiveness of early detection and intervention in NCD countermeasures are needed. These should assess primary care physician health management continuity, preventive healthcare provision, and coordination with other medical institutions.
- **Task shifting and sharing implementation indicators**: Indicators that assess the progress of task transfer among various medical institution roles, as well as the completion of training and nurse activities, along with the extent of physician workload reduction, are essential. These indicators should be tailored to the facility's size and regional characteristics to effectively evaluate the outcomes of work style reform.

- Labour productivity indicators for healthcare workers: Indicators quantifying clinical achievements per healthcare professional and ICT and AI utilisation efficiency gains are crucial for evaluating work style reform and healthcare quality balance.
- Quality indicators for regional healthcare access: Comprehensive indicators evaluating access and quality to regional healthcare, considering travel time, 24-hour service availability, and home healthcare provision systems. Currently, the absence of standardised evaluation criteria makes inter-regional comparisons challenging.
- Evaluation indicators for healthcare coordination systems: Indicators assessing the progress of medical institution functional differentiation and the state of inter-institutional coordination based on regional healthcare visions are needed. Measuring the effectiveness of a consistent healthcare delivery system from prevention to treatment in NCD countermeasures is particularly important.

RECOMMENDATIONS

1. Reinforcement of work efficiency for healthcare professionals through digital utilisation: Enhance healthcare professionals' operational efficiency and reduce regional disparities by implementing ICT telemedicine support systems, AI-driven medical documentation tools, and multi-professional information sharing platforms. Specifically, to address regional physician shortages, promote the "D to P with N (Doctor to Patient with Nurse)" model, where nurses visit patients equipped with tablets to connect with physicians online, especially for managing chronic illness patients.
2. Promotion of local healthcare through digital utilisation: Optimise the use of regional medical resources by implementing telemedicine for home consultations, remote imaging, and pathology diagnostics.
3. System development for effective task shifting and sharing: Implement systems using objective indicators like documented actions, training participation, and visualisation to assess task shifting and sharing. Outcomes should guide reimbursement, be integrated into standards, and supported by measures encouraging these efforts. For example, establish practical training programmes that promote interprofessional collaboration in primary care, with a focus on NCD early intervention, prevention, and long-term follow-up
4. Strengthening the primary care system as the core for NCD countermeasures: Enhance General Practice Physician Development by expanding financial aid for mentor support and training system setup. Establish practical NCD countermeasure training with multidisciplinary collaboration. Develop objective primary care quality indicators for reimbursement policies. Support primary care physicians with online specialist consultations to assist private practitioners and rural young doctors in maintaining and improving healthcare quality.
5. Systematisation of medical workforce securing measures according to regional and medical specialty characteristics: Determine the necessary number of physicians based on regional and specialty-specific medical needs, and deploy appropriate distribution strategies. Enhance financial incentives for healthcare workers in areas or specialties with shortages, and explore systems that promote regional healthcare engagement during specialty training. Develop ICT-based support systems that allow central hospitals to assist nearby regions in addressing physician shortages. Promote the retention of regional medical staff through collaborative efforts between local governments and medical institutions, including improvements to living conditions.

DOMAIN 6

Medicines and technology

Introduction

Although Japan maintains high standards in access to medical technology, efforts to boost its competitiveness in medical innovation must be prioritised to support early intervention for NCDs. Additionally, our analysis highlights current challenges to pharmaceutical innovation and the adoption of digital health technologies. To tackle these issues, our recommendations include comprehensive reforms to the drug pricing system, strengthening clinical trial infrastructure, and accelerating medical digitalisation to ensure equitable access to innovative NCD treatments. Evidence shows that 72.4% of pharmaceuticals approved in the United States and Europe remain unavailable in Japan, with Japanese companies contributing only 3% to global antibody drug development and 1% to gene therapy innovations [24][25]. These gaps, compounded by a 42% electronic medical record (EMR) adoption rate compared to the OECD average of 93%, weaken Japan's ability to utilise technological advances for NCD prevention and treatment [13]. This analysis examines these challenges across three critical domains: access to diagnostics and treatments, research and development capacity, and digital health infrastructure, proposing targeted policy measures to strengthen Japan's medical technology ecosystem.

Table 5. Key data on pharmaceuticals and medical technology in Japan

Rank	Indicator	Past year	Latest year	Change (%)
	CT, MRI, PET units per million population	2011 [166]	2021 [120]	
	CT	101.3	115.7	+14%
	MRI	46.9	57.4	+22%
	PET	na	4.7	
	Average review time for new drugs (days)	2011 [217]	2020 [217]	
	Japan	367	313	-15%
	United States	na	244	
	European Union	na	426	
	Canada	na	306	
	Australia	na	315	
	Pharmaceuticals with new active ingredients unapproved in Japan approved in Europe and United States (top 5 therapeutic classes)*	2016 [218]	2020 [218]	
	Total	117	176	+50%
1	Antineoplastic agents	21	44	+110%
2	Systemic anti-infectives	17	22	+29%
3	Nervous system agents	11	22	+100%
4	Gastrointestinal and metabolic agents	16	19	+19%
5	Blood and blood-forming organs agents	8	11	+38%
	Number of clinical trials in top 5 countries during period January 1999 to June 2024 [219]			
1	United States		186,497	
2	China		135,747	
3	India		74,031	
4	Japan		65,167	
5	Germany		54,902	
	Adoption rate of EMR systems	**2014 [220]**	**2023 [220]**	
	General hospitals (400+ beds)	77.5%	93.7%	21%
	General hospitals (200–399 beds)	50.9%	79.2%	56%
	General hospitals (20–199 beds)	24.4%	59.0%	142%
	General clinics (0–9 beds)	35.0%	55.0%	57%

Notes: * new drugs unapproved in Japan that had been approved in the United States and Europe over the previous 4 years.
na = data not available.

Subdomain 6.1: Access to diagnostics and treatment

Disparities in access to diagnostic equipment across regions

Regional disparities in the distribution of advanced medical equipment hinder the equitable implementation of NCD strategies despite Japan's world-leading healthcare infrastructure. To address this, Japan must optimise the allocation of medical devices based on regional healthcare needs rather than institutional capacity. Developing prefecture-level deployment strategies aligned with Community Healthcare Visions could help prevent equipment shortages and redundant investments. Although Japan has the highest number of CT scanners (115.7), MRI machines (57.4), and PET scanners (4.7) per million people among OECD countries, disparities across prefectures still exceed threefold, according to the MHLW's 2014 Survey of Medical Institutions [13][210]. This uneven distribution places financial strain on over-equipped regions and limits diagnostic access in underserved areas [211]. Implementing remote imaging diagnostics and telemedicine could reduce these disparities by providing residents of remote islands and depopulated areas with access to specialist interpretations without the need for physical proximity to equipment.

Current status and challenges of medicine access

Despite significant advancements in streamlining drug approval processes in Japan, these do not always lead to actual market availability, resulting in a persistent "drug lag" that restricts NCD treatment options. Additional reforms to pharmaceutical pricing mechanisms would incentivise market entry while maintaining approval efficiency. Although median review times decreased to 313 days in 2020 and drug price listing was achieved within 73 days – faster than Germany (120 days) and France (527 days) – 176 of 243 pharmaceuticals (72.4%) approved in the US and Europe between 2016–2020 remain unavailable in Japan [22][23][24]. The number of unapproved antineoplastic agents doubled from 21 to 44 during this period, directly limiting cancer treatment options [212]. Establishing special measures for high-need therapeutic areas, particularly oncology, which includes 44 unapproved drugs, would help accelerate patient access to these therapies. This paradox of efficient approval yet limited availability highlights the need for comprehensive reform of value assessment to ensure timely access to treatment options.

Challenges in insurance coverage for cancer genomic medicine

Cancer gene panel testing, which involves the analysis of multiple genetic mutations from a patient's tumour in a single test, is pivotal to advancing cancer genomic medicine. Restrictive insurance coverage for cancer gene panel testing hinders the timely implementation of precision medicine, thereby reducing opportunities for early intervention. Current regulations limit insurance coverage to patients without standard treatment options or those who have exhausted therapeutic alternatives, resulting in missed treatment opportunities when actionable mutations are identified too late for effective intervention [213][214]. Insurance coverage should be extended beyond late-stage patients to include suitable testing from early treatment phases. Adopting the recommendations from the 2023 joint statement by patient advocacy groups, healthcare policy organisations, and academic societies would facilitate genomic-guided treatment decisions before patient deterioration. The failure of the April 2025 medical fee revision to address these limitations sustains suboptimal timing of genomic testing [215][216]. Early gene panel testing could enhance treatment outcomes and potentially lower overall healthcare costs through early intervention with targeted therapies.

Institutional challenges of Multi-Companion Diagnostics (Multi-CDx)

Multi-Companion Diagnostics (Multi-CDx) are essential in delivering personalised medicines and cancer treatments. Multi-CDx is a diagnostic system that simultaneously examines multiple genetic mutations in a patient's tumour tissue through a single test, enabling the selection of the most appropriate molecular-targeted therapy based on these results [221]. Despite the promise of this

technology, fragmented Multi-CDx systems impose unnecessary burdens on cancer patients while hindering efficient personalised care. To address this fragmentation, standardised diagnostic protocols should be developed to consolidate testing requirements across different products. Creating a comprehensive genetic testing framework would eliminate redundant sample collections and lower associated costs. Variations in targeted mutations and the alignment with corresponding molecular-targeted agents across diagnostic products currently require multiple tests per patient, leading to additional costs and repeated sample collection burdens [214][221]. This systemic inefficiency contradicts the primary goal of Multi-CDx technology – streamlining genetic analysis for optimal therapy selection. Harmonising diagnostic standards would improve both clinical efficiency and patient experience in precision oncology.

Institutional barriers in the development and dissemination of innovative medical technologies

Japan's current pharmaceutical pricing and regulatory policies may weaken incentives for innovation, thereby discouraging the launch of new drugs. Key issues include frequent price revisions and the requirement for additional clinical data. Since 2021, drug price adjustments, previously made every two years, now occur annually, with prices decreasing on average by 2.4% to 5.0% per year [225][226]. In this system, if medical institutions purchase pharmaceuticals at a price below the MHLW-established price, the drug price is reduced to close the gap [223]. When sales exceed projections, a temporary "market expansion re-evaluation" price cut is applied. Since 2016, highly sold pharmaceuticals face additional reductions [224].

Additionally, the Pharmaceuticals and Medical Devices Agency, an independent agency, requires Japan-specific clinical data for approval, which can prolong approval times even when international safety data is available [222]. These factors together reduce the appeal of R&D investments in new therapies, as ongoing price declines undermine profit predictability [227]. Implementing transparent, value-based pricing systems that reflect therapeutic benefit could boost innovation, improve business certainty, and ensure the affordability of new therapies.

Subdomain 6.2: R&D capacity

The current state of pharmaceutical drug discovery in Japan

Japan's standing in pharmaceutical innovation capacity is currently facing significant challenges, especially in advanced therapeutic modalities, which could be vital for next-generation treatments. In September 2020, Japanese companies' global market share was only 9% for small molecules, 3% for antibodies, 1% for nucleic acid and gene therapies, and 4% for cell therapies – significantly behind the United States (42%, 46%, 57%, 48% respectively) and even China in certain areas [25]. This innovation gap directly affects domestic access to cutting-edge NCD therapies, as limited local development capacity diminishes incentives for foreign firms to prioritise entering the Japanese market. The government must support biotechnology capabilities through targeted funding mechanisms and international collaborations. Expanding Bio-economy Strategy initiatives beyond the Greater Tokyo Bio community's 690 billion Yen private investment success could stimulate nationwide innovation [214]. Strengthening drug discovery through strategic public-private partnerships would improve both therapeutic sovereignty and patient access to innovative treatments.

Clinical trial implementation status and international competitiveness

Japan's clinical trial ecosystem faces similar obstacles that could threaten its position in global research networks and limit access to innovative NCD treatments. In 2024, Japan's annual clinical trial numbers dropped from its historical lead to only 665 trials, ranking 14th worldwide, behind India (7,455), China (7,106), and the US (5,999) [228]. Participation in international collaborative trials remains at 26.9%, much lower than the US (81.5%) and the UK (42.8%), which isolates Japan from

multi-regional development efforts [26]. Challenges include language barriers, fragmented patient populations at different sites, and limited digital infrastructure which compound recruitment challenges and per-patient costs [229][230]. Introducing Decentralised Clinical Trials (DCT), which use digital technology to allow remote patient participation, could address some issues by reducing patient burden and enhancing case accrual. However, Japan's slower digital health adoption has delayed DCT implementation. Immediate steps should include developing English-friendly trial infrastructure, leveraging digital technology for decentralised trials, and creating comprehensive patient databases accessible to sponsors to improve site selection and recruitment. Without advancing international and digital capabilities, Japan risks being excluded from global innovation in therapeutics.

National strategy and research and development support system

Japan's medical R&D support infrastructure demonstrates a strategic vision, but its implementation needs improvement to maintain its competitive edge in innovation. In 2014, the Cabinet Office formulated the First Healthcare Policy, leading to the creation of the Japan Agency for Medical Research and Development (AMED) in 2015 to promote research and development consistently from basic research to commercialisation [231]. This established a structured framework to advance medical R&D, with a budget of approximately JPY 123.2 billion managed by AMED and about JPY 81.3 billion allocated to national research institutions for the fiscal year 2025 [232]. AMED's coordination role could expand beyond funding distribution to actively fostering international partnerships and capacity building. The government's Bio-economy Strategy 2024 focuses on antibody pharmaceuticals, nucleic acid medicines, and gene therapies, aligning with global therapeutic trends [233]. This scheme also supports the creation of a bio community nationwide, replicating Greater Tokyo's model, which accelerated the development of interdisciplinary innovation hubs, bringing together industry, academia, and government partners. However, translating strategic intent into commercial outcomes requires addressing execution gaps in clinical trial infrastructure and international collaboration.

Challenges and responses in clinical research networks

National-level fragmentation in clinical research governance is another factor contributing to Japan's challenges in clinical research [234]. Establishing a national clinical trial coordinating body, similar to the US National Cancer Institute, would standardise protocols and improve efficiency. The Japanese Cancer Trial Network (JCTN), a cooperative group for multi-centre clinical trials in oncology, is working to enhance research quality by standardising clinical trial procedures, sharing information, and promoting collaborative trials [235]. Expanding JCTN's standardisation efforts across therapeutic areas beyond oncology would help create a comprehensive trial infrastructure. The lack of centralised trial oversight leads to duplicative efforts and inconsistent quality across research groups, contrasting with the integrated systems in the United States. AMED's Asian clinical research network initiatives since 2020 demonstrate recognition of the importance of international collaboration, establishing systems for sharing clinical data with medical institutions across Asian countries and supporting multi-centre clinical trials; however, domestic coordination still remains suboptimal [236]. Creating unified governance would reduce redundancy, improve data quality, and accelerate evidence generation for both domestic and global therapeutic development.

Subdomain 6.3: Digital health and data

Development status and challenges of medical information infrastructure

Japan's slow progress in medical digitalisation could lead to various inefficiencies that hinder NCD care coordination and population health management. Currently, only 42% of primary care providers use EMR systems, indicating a need for increased efforts to promote the adoption of standardised,

cloud-based EMR solutions across all healthcare environments. Offering targeted financial incentives and technical assistance to smaller facilities with fewer than 200 beds could help close the adoption gap between large hospitals, which have a 93.7% adoption rate, and smaller institutions, at 59.0% [237]. An OECD comparison shows Japan's EMR adoption is less than half the 93% average among 24 member countries, highlighting systemic gaps in health system digitisation [13]. This lack of infrastructure may impede effective care coordination, lead to duplicate diagnostics, and hinder population-level NCD monitoring. Without full digitalisation, data-driven early intervention strategies are severely limited. The link between facility size and EMR usage suggests that resource constraints, rather than technological issues, are the primary barriers, necessitating targeted approaches.

Current state of medical data utilisation

Japan has substantial health data assets but lacks the necessary infrastructure for integration to effectively support NCD prevention and management. While 85% of OECD-defined key healthcare datasets are available – more than the United States' 54% – Japan's data remains siloed and underutilised [238]. The gap between data availability and its analytical use highlights missed opportunities to identify at-risk populations, optimise resource allocation, and assess intervention outcomes. France and the UK's higher data integration levels, with 92% availability, show what is achievable. To address this, the MHLW established the Data Health Reform Promotion Headquarters in 2017 and developed the "Roadmap for Data Health Reform" in June 2021, along with the Medical DX Reiwa Vision 2030 [239][240][241]. The success of these efforts depends on investments to expedite the standardisation and interoperability of health system platforms.

Progress in data health reform and healthcare DX

Japan's Medical DX initiatives offer a comprehensive vision, but they require accelerated implementation to address current deficiencies. Medical DX Reiwa Vision 2030 presents a three-pillar approach which prioritises cloud-based EMR deployment while building toward full integration of health system platforms. The Data Health Reform Roadmap (2021) and Medical DX Reiwa Vision 2030 articulate ambitious goals which are described in detail below: nationwide health information platforms, standardised EMR systems, and unified medical remuneration calculations [239][240][241].

- Establishment of a nationwide healthcare information platform: A nationwide digital platform will be created to securely share and reference various medical data, including patient health checkup results, vaccination records, medication details, and medical billing statements [241]. This effort aims to improve information sharing across regions and healthcare providers, ensuring ongoing access to patient information.
- Standardisation of EMR systems: The various existing formats of medical records used by healthcare institutions will be consolidated into a single standard format, aiming to have uniform EMR systems in all healthcare facilities by 2030 [241]. Extra support will be directed toward smaller institutions that are behind in digital adoption, offering them internet-enabled EMR systems that meet regulatory standards to facilitate their transition.
- DX of medical remuneration revisions: To ease the burden on healthcare institutions of updating systems with each medical remuneration change, the government will create and distribute a nationwide uniform calculation programme [242]. This aims to reduce administrative work and enable quick implementation of revisions. As of 2024, the government has improved and released a master table serving as a common language across institutional systems, along with a unified electronic fee schedule to reduce shared costs. Full-scale provision of a common calculation module is planned by 2026, which will be embedded into standardised receipt systems and EMRs to drastically streamline administrative processes and minimise indirect costs for healthcare providers.

However, the execution pace lags behind the vision, particularly in smaller institutions that lack resources for digital transformation. Establishing interim milestones with accountability mechanisms would ensure the 2030 targets translate into tangible progress.

Challenges in the development and dissemination of digital medical technologies

Software as a Medical Device (SaMD) is a new medical technology that uses AI and smartphones to improve accuracy through data learning. Although tools like hypertension treatment support apps are already covered by insurance in Japan, the pace of product development is slower compared to other countries. With only 23 mobile app medical device trials versus 1,006 in the US, and 75 AI medical device trials versus 204 in China, Japan's digital therapeutics pipeline is significantly underdeveloped [209]. Speeding up SaMD development requires more efficient data access protocols and better regulatory responsiveness. Limited access to medical data for developers increases regulatory uncertainty, despite the launch of DASH for SaMD reforms in 2020 and their expansion in 2023 [243][244]. The innovation gap risks diminishing Japan's ability to utilise digital solutions for NCD management, from AI-assisted diagnostics to behavioural intervention apps. Broader adoption and faster approval of these technologies can directly support early intervention for NCDs by enabling continuous risk monitoring, personalised health guidance, and timely referral through user-friendly mobile interfaces. Broadening DASH for SaMD initiatives to include developer incubation and international partnership support would boost innovation.

Challenges of the digital divide

The digital divide among Japan's elderly significantly weakens the impact of digital health initiatives targeting the demographic most affected by NCDs. With 50.9% of those aged 70 and older not using digital devices, a large portion of the NCD-affected population remains excluded from digital health benefits [27]. Implementing comprehensive digital literacy programmes within healthcare services should be a priority when developing and deploying this technology. The Japan Geriatrics Society has recommended that during online medical consultations for the elderly, initial setup support and accompaniment during consultations by healthcare or caregiving staff, as well as patient family members, are necessary [245]. Digital exclusion reinforces health inequities, particularly among those who need intensive NCD management. This underutilisation hinders timely engagement with digital monitoring tools, personalised health guidance, and remote consultations – potentially delaying interventions and contributing to suboptimal health outcomes in this high-risk population. Developing age-friendly interfaces, establishing support networks through healthcare and community organisations, and involving family support could improve adoption rates.

Subdomain 6.4: Key findings, summary indicators and recommendations

KEY FINDINGS

- Despite world-leading medical equipment density, threefold regional disparities undermine equitable NCD diagnostic access. Japan's 115.7 CT, 57.4 MRI, and 4.7 PET scanners per capita rank among the top among OECD 38 member countries, yet prefecture-level disparities create both access gaps and financial maldistribution, which requires coordinated deployment planning aligned with regional health needs rather than institutional capacity.
- Efficient drug approval processes coexist with market access limitations, constraining NCD treatment options. Despite median review times of 313 days and price listing periods of 73 days, 72.4% of drugs approved in the US and EU are still not available in Japan. This includes a doubling of unapproved cancer therapies to 44 between 2016 and 2020 [22][23][24][212]. The "drug lag" results from pricing disincentives and regulatory barriers, highlighting the need for comprehensive reform.

- Japan's biopharmaceutical innovation capacity has decreased to globally marginal levels, threatening therapeutic innovation. Japanese companies account for only 3% of antibody drugs, 1% of gene therapies, and 4% of cell therapies globally, while their participation in international trials has dropped to 26.9% compared to 81.5% in the US [25][26]. This innovation deficit directly impacts domestic access to next-generation NCD treatments, necessitating a strategic rebuilding of R&D capabilities.
- Medical digitalisation lags dramatically behind international standards, preventing data-driven NCD management. Primary care EMR adoption at 42% falls far below the OECD average of 93%, while only around 50% of small hospitals and clinics (fewer than 200 beds) have done so. Moreover, 50.9% of elderly citizens lack access to digital devices [13][27][237]. The challenges in infrastructure and user adoption hinder care coordination, population health analytics, and the deployment of digital therapeutics, which are essential for comprehensive NCD strategies.

KEY PERFORMANCE INDICATORS AND CURRENT MEASUREMENTS

- Advanced medical equipment distribution (per million population): 115.7 CT, 57.4 MRI, 4.7 PET scanners (2021) [13] – While achieving global leadership in absolute numbers, addressing prefectural disparities remains critical for equitable access. Regional optimisation based on health needs would improve both access and financial sustainability.
- Drug access and approval metrics: 313-day median review, 73-day price listing, 72.4% drugs unavailable domestically (2020) [22][23][24] – These paradoxical indicators and the resulting "drug lag" showcase the impact of efficient regulation undermined by commercial barriers. The doubling of unavailable cancer drugs particularly impacts NCD treatment options, requiring pricing reform to translate regulatory efficiency into patient access.
- Biopharmaceutical innovation indicators: 3% antibody drugs, 1% gene therapies, 4% cell therapies market share; 26.9% international trial participation (2020/2023) [25][26] – Japan's limited global role in advanced therapeutics development directly relates to restricted domestic access. Reversing this trend requires a comprehensive strengthening of the ecosystem, extending beyond increased funding.
- Medical digitalisation metrics: 42% primary care EMR adoption (2021); 50.9% elderly digital device non-usage (2023) [13][27] – With an OECD average of 93% EMR, substantial efforts are essential to build infrastructure and improve digital literacy, addressing adoption and tackling elderly digital exclusion.
- Clinical trial activity: 665 annual trials ranking 14th globally (2024) [228] – The decline behind trailing India (7,455) and China (7,106) indicates accelerating marginalisation. To regain competitiveness, it is essential to address infrastructure and cost barriers concurrently.

INDICATORS TO BE DEVELOPED IN THE FUTURE

- Comprehensive evaluation indicators for medical innovation: Establishing indicators to evaluate the medical and societal value of new healthcare technologies is essential. Future frameworks should capture benefits beyond clinical efficacy, such as maintaining employment, reducing caregiver burden, and preventing long-term costs through early intervention. Current assessments undervalue societal impacts, leading to poor resource allocation. Future indicators must measure the societal benefits of healthcare technologies, aiding policy decisions. Holistic evaluation methods would support evidence-based coverage that recognises full therapeutic value.
- Maturity indicators for R&D ecosystem: Quantitative assessment of industry-academia-government collaboration effectiveness, innovation pipeline productivity, and global competitiveness requires integrated indicators. Tracking Japanese-originated pharmaceutical market shares across countries, clinical trial efficiency metrics, and partnership outcome measures would guide targeted interventions.

- Maturity indicators for healthcare DX in institutions: Evaluating digitalisation must extend beyond adoption rates to measure actual utilisation, data quality, and care improvement outcomes. Size and region-specific assessments would identify targeted support needs while demonstrating return on investment. Metrics should capture interoperability achievements, clinical decision support utilisation, and measurable efficiency gains from digitalisation.
- Equity indicators for medical access: A comprehensive assessment of regional disparities in technology access, usage patterns, and health outcomes can quantify inequality impacts. By integrating data on equipment distribution, utilisation rates, travel burden, and outcome differences, we can pinpoint areas needing priority intervention. Additionally, metrics on telemedicine adoption and effectiveness would help evaluate the role of digital solutions in addressing disparities in access.
- Population digital health engagement: Beyond just owning devices, tracking how different groups use digital health services, their satisfaction levels, and improvements in health outcomes can guide the design to be more user-centred. Assessing digital literacy, identifying support needs, and analysing barriers to engagement would help develop targeted interventions. Using metrics based on age groups would ensure the elderly are included in the advantages of digital health.

RECOMMENDATIONS

1. Reform pharmaceutical and medical device value assessment systems (MHLW, pharmaceutical industry; 2026 implementation): Japan's price reduction policies and lack of innovation recognition create market barriers, with 72.4% of US/EU-approved drugs unavailable. Adopting comprehensive value assessments that incorporate real-world data, societal benefits, and long-term cost savings could help restore predictability. Additionally, shifting from automatic price cuts to outcome-based adjustments would better incentivise innovation and affordability.
2. Strengthen governance functions in clinical research platforms (MHLW, AMED, JCTN; 2025–2027): To mitigate fragmentation, governance functions within existing platforms such as JCTN and AMED should be enhanced to support protocol harmonisation, registry interoperability, and cross-disease coordination. This approach offers a feasible pathway to streamline trial processes without creating new institutions.
3. Accelerate domestic and global clinical development integration: The government should develop and share databases of patient information, such as potential participant numbers and their willingness to take part. Strengthening the Asia clinical research network, led by AMED, would support multi-country trials. Promoting AI-powered translation tools and accepting documents in English will help facilitate foreign participation. Using overseas trial data can speed up the approval process. For high-need areas, like oncology, measures such as simplifying Phase I trials are necessary to reduce review times. To advance innovative Japanese medical technology, collaboration among trial groups should be enhanced and procedures standardised, such as expanding JCTN, to generate high-quality evidence and bolster research infrastructure.
4. Implement comprehensive medical digitalisation programme (MHLW, prefectural governments, medical associations; 2025–2030): Bridging the 51 percentage point gap between Japan's 42% and the OECD's 93% EMR adoption calls for tailored support strategies. Providing cloud-based standardised systems with implementation subsidies for facilities with fewer than 200 beds would help overcome resource limitations. Simultaneously, elderly digital literacy programmes aimed at the 50.9% who do not use EMRS, through healthcare facility-based training, would promote inclusive adoption. To meet the 2030 Medical DX goals, urgent efforts are needed to accelerate progress beyond current incremental advances.

5. **Establish population health management infrastructure** (Cabinet Office, MHLW, technology providers; 2025–2028): Connecting nationwide health information platforms with Personal Health Record systems could facilitate proactive prevention of NCDs. Applications based on behavioural science, offering financial incentives such as insurance discounts and reward points, would promote long-term engagement. Population analytics with privacy and confidentiality guardrails would help identify at-risk groups for targeted interventions. This infrastructure would convert Japan's 85% OECD-defined key healthcare datasets into active prevention tools. These combined efforts support the society-wide backing of "sustainable self-management" for the prevention of NCDs.

6. **Optimise regional medical technology distribution** (MHLW, prefectural governments; 2025–2027): Addressing the three main equipment disparities requires deployment strategies aligned with Community Healthcare Visions, rather than encouraging competition between institutions. Creating remote diagnostic networks that connect specialists to underserved areas can optimise the use of existing infrastructure. Careful investment protocols that prevent shortages and redundancies will improve financial sustainability and support universal access. This rebalancing aims to resolve the current issues of overinvestment, which causes financial strain and gaps in access to health services. Through these policies, an equitable healthcare delivery system will be established, ensuring that residents in any region can access high-quality diagnostics and treatments.

DOMAIN 7

Environment

Introduction

As of 2014, it is estimated that Japan's healthcare sector produces 6.4% of the country's greenhouse gas emissions [28]; however, integrated policies that acknowledge how early NCD intervention reduces environmental impact are lacking. To enhance the environmental sustainability of the health system and reduce the potential environmental effects of NCDs, strategies that leverage co-benefits between disease prevention and emissions reduction are necessary. Globally, initiatives led by United Nations entities and the WHO, especially the "Alliance for Transformative Action on Climate and Health" (ATACH), are progressing efforts such as developing climate-resilient health systems [246]. Despite joining the Alliance for Transformative Action on Climate and Health in May 2024, Japan has yet to turn this commitment into actionable policies addressing the dual challenges of NCDs and climate change [28][247]. The exclusion of healthcare from the government's 14 priority areas in the 2021 Green Growth Strategy highlights a systemic disconnect between health and environmental policy domains [251]. Japan should accelerate the implementation of its ATACH commitments by setting concrete targets that connect NCD management improvements with environmental outcomes. This domain examines how strengthening early NCD intervention creates environmental co-benefits while assessing Japan's readiness to adapt to climate-related health impacts, proposing integrated policy frameworks that advance both health and sustainability goals.

Table 6. Key data on GHG Emissions in Japan's healthcare sector

Rank	Indicator	Latest year
	Proportion of GHG emissions in Japan from the healthcare sector [257]	**2014**
	Japan	6.4%
	Proportion of global GHG emissions from the healthcare sector by the top 5 countries (%) [257]	**2014**
1	United States	27
2	China	17
3	European Union	12
4	Japan	5
5	Russia	4
	CO_2 emission reduction compared to 2013 in the medical sector* [258][259]	**2022**
	The Federation of Pharmaceutical Manufacturers' Associations of JAPAN	35.6%
	The Japan Medical Association and the Four Hospital Association	22.6%
	Medical institutions engaged in low-carbon society initiatives (number of facilities, %) [259]	**2022**
	Private hospitals	5,246 (76.0%)

Notes: * rates based on self-assessments.

Private hospitals = hospitals established by entities other than the national or local governments (e.g. prefectural and municipal).

Subdomain 7.1: Impact of NCDs on the environment

National Recognition of the Impact of NCDs on the Environment

Despite recognising the health sector's significant environmental footprint, Japan's commitments to achieve carbon neutrality could be compromised by its fragmented approach to managing emissions in the health system. While the 2018 Climate Change Adaptation Act addresses the impacts of extreme weather, it does not acknowledge healthcare's contribution to climate change – 4.6% of national emissions in 2011, rising to 6.4% by 2014, making Japan the fourth-largest emitter globally after the United States, China, and the EU [28][249]. The 2016 Plan for Global Warming Countermeasures relies on voluntary commitments from industry, leaving 24% (1,678) of private hospitals uncommitted to emission reduction efforts as of 2022 [30][250]. This voluntary approach contrasts with the UK NHS's mandatory net-zero targets by 2040, highlighting Japan's policy gap [248]. However, the plan does include industry associations overseen by the MHLW, such as the Federation of Pharmaceutical Manufacturers' Associations of JAPAN, the Japan Medical Association, and the Four Hospital Associations, recognising the need to reduce the environmental impact across all actors within the healthcare sector. More efforts could be made to embed healthcare decarbonisation into national climate strategies through mandatory participation and monitoring frameworks. Establishing healthcare-specific emission reduction targets within the Plan for Global Warming Countermeasures would better align reduction efforts within the healthcare system with the national goal of carbon neutrality by 2050. Without fully integrating healthcare into climate strategies, Japan will struggle to achieve meaningful emissions reductions while also tackling the rising burden of NCDs.

Possibility of Mitigating Environmental Impact through Early Diagnosis of NCDs

Early intervention for NCDS presents a significant opportunity to improve health and reduce emissions simultaneously; yet, policies often overlook these co-benefits. Data show that inpatient services produce 5.4 times more greenhouse gases per patient compared to outpatient care, with hospital stays accounting for the largest part of healthcare's carbon footprint [252]. A study of 70,627 CKD patients found that emissions increase as the disease progresses, indicating a clear link between early intervention and environmental gains [253]. These results imply that efforts to strengthen NCD management can benefit both patient health and the environment. Incorporating evaluation of these environmental co-benefits alongside traditional clinical and economic assessments within policymaking can help justify increased investments in prevention, leading to improved health outcomes and reduced carbon emissions. Recognising these dual benefits of prevention would strengthen business cases for expanding screening programmes and primary care funding.

National efforts to reduce CO_2 emissions from NCD-related services

While industry self-regulation has advanced progress toward decarbonising healthcare, sustained efforts demand comprehensive policies with strong enforcement. The Federation of Pharmaceutical Manufacturers' Associations achieved a 35.6% reduction against their 46% 2030 goal, whereas the Gour Hospitals Association only reached a 22.6% reduction by 2022 [29][30]. About 24% of private hospitals are not part of voluntary initiatives, indicating that current strategies may fall short of required emission cuts. The lack of clear roadmaps, support for implementation, and monitoring systems hampers the efforts of dedicated participants. Japan's dependence on voluntary measures, unlike international mandatory frameworks, curtails accountability and progress. Enacting comprehensive regulations would guarantee universal participation and provide vital technical and financial support to smaller facilities struggling with implementation. Particularly, promoting the installation of high-efficiency equipment such as LED lighting, cogeneration systems, and heat pump-based air conditioning, along with the introduction of renewable energy sources like solar power, can significantly reduce energy use in medical facilities. These investments not only reduce

emissions but also lower long-term operational costs, thereby contributing to the financial sustainability of healthcare institutions.

Consideration of environmental factors in national policy-making

Environmental sustainability is currently missing from key NCD policies, leaving the co-benefits of interventions overlooked. Integrating environmental impact assessments and sustainability criteria into the planning and evaluation of NCD policies is essential. Establishing cross-ministerial coordination would help align health and environmental goals. Existing frameworks, such as Health Japan 21 (Third Term) and disease-specific strategies, do not address emissions reduction or resource efficiency, despite healthcare's substantial environmental impact [77]. This gap remains even though initiatives like the Strategic Initiative for Creating a Healthy and Sustainable Food Environment show successful integration of health and environmental policies, aiming to reduce environmental impacts in the food sector. International models, such as the EU's European Green Deal, demonstrate the practicality of frameworks that combine climate change efforts with public health protection, which Japan could strengthen through its participation in ATACH [254].

Subdomain 7.2: Adaptation of NCD-related services to climate change

Assessment of health impacts due to climate change

Climate change increases NCD risks through various pathways, disproportionately affecting vulnerable populations with chronic and underlying conditions. International evidence shows clear links between extreme heat and cardiovascular events, with the elderly facing compounded risks from both age-related vulnerabilities and NCD burdens during extreme weather. Elevated ozone levels have been associated with an increase in total mortality, as well as deaths from cardiovascular and respiratory diseases [31]. The impact of intense heat is particularly pronounced among the elderly, who are at higher risk for both the onset and severity of heatstroke. The Ministry of Environment's 2020 Assessment Report reports an increase in cardiovascular mortality linked to rising temperatures and respiratory impacts from photochemical oxidants, while recognising significant gaps in knowledge concerning children and patients with underlying conditions [31]. To develop effective adaptation strategies for those most at risk, climate health surveillance could be expanded to include NCD-specific indicators and stratification of vulnerable groups. Creating real-time monitoring systems that connect environmental conditions to NCD exacerbations would allow for targeted interventions. Importantly, limited insights into these high-risk populations can delay or misdirect preventive strategies, undermining early interventions that might otherwise reduce avoidable hospitalisations and deaths during extreme weather events. Comprehensive assessment strategies that incorporate risk stratification for vulnerable populations are essential to implement adaptation measures that can effectively protect those most at risk from climate-related health impacts.

Measures in the healthcare sector against climate change

Current climate adaptation efforts focus on acute heat-related illnesses as well as health system resilience for NCD patients during extreme weather events. Despite Japan's readiness, implementing mandatory climate vulnerability assessments could strengthen climate resilience frameworks that ensure service continuity. The Ministry of the Environment has introduced the Heat Illness Prevention Action Plan, aiming to reduce heatstroke deaths by 50% by 2030 [255]. As part of this initiative, it has launched the "Heatstroke Alert" nationwide to warn residents during extremely hot periods [256]. Alongside efforts by the MHLW to distribute educational materials, the plan encourages collaboration between local governments and industries to promote heatstroke awareness, implement measures in hot conditions, and invest in R&D of technologies for predicting heat-related impacts [256][260]. To reduce the health effects of extreme heat, a comprehensive

approach involving the entire health system, including medical services, is essential. For instance, it is crucial to assess whether the current healthcare infrastructure – such as emergency transport, deployment of medical personnel, and hospital bed availability – is sufficient to handle a potential surge in emergency cases during future extreme heat events.

To combat air pollution, the Ministry of the Environment provides real-time data on air pollutant levels, such as photochemical oxidants, and issues warnings through the 'Atmospheric Environmental Regional Observation System" [261]. Additionally, the National Institute for Environmental Studies offers experimental forecast data (VENUS) for the next day, covering the East Asian region [262]. Progress is also being made in expanding scientific understanding of long-term climate change. The Ministry established the "Environment Research and Technology Development Fund" to support broad environmental research, including policies for a sustainable society – addressing climate change, promoting recycling, coexisting with nature, and managing environmental risks [263].

The 2022 BCP guidelines for medical facilities, devised by the MHLW, address disaster response and suggest specific measures, such as securing emergency power supplies and conducting triage training; however, they insufficiently consider climate-specific risks to NCD care continuity [264]. Emergency transport systems, medication supply chains, and dialysis services remain vulnerable to climate disruptions without targeted adaptation planning. International frameworks highlight the need for NCD-specific climate protocols, including medication storage during power outages, alternative care pathways during facility closures, and proactive patient communication systems.

Improving housing thermal insulation offers dual advantages: it enhances residents' health and helps protect the environment through energy savings. Local governments have launched subsidy programs for insulation upgrades, such as the "Tottori Healthy Energy-Saving Housing Performance Standards", which provide up to JPY 1 million for homes meeting specific insulation and airtightness criteria [265]. Initiatives like those in Tottori Prefecture demonstrate potential for lowering both emissions and health risks, and if adopted nationwide, could yield significant environmental benefits.

Subdomain 7.3: Key findings, summary indicators and recommendations

KEY FINDINGS

- Japan's healthcare sector generates 6.4% of national emissions – ranking fourth globally – yet operates without mandatory decarbonisation frameworks. Voluntary industry targets achieve variable progress: pharmaceuticals reached a 35.6% reduction, while hospitals achieved only a 22.6% reduction toward their 46% target by 2030, with 24% of private hospitals (1,678 facilities) having not participated in such schemes as of yet [28][29][30]. This warrants a comprehensive approach that enacts mandatory frameworks with universal participation requirements to deliver on emissions reduction commitments.
- Early NCD intervention delivers quantifiable environmental co-benefits that current policies fail to recognise or incentivise. Inpatient services generate 5.4 times higher emissions per patient than outpatient care, while CKD progression directly correlates with increasing per-capita emissions [252][253]. These findings establish clear environmental returns from prevention investments, yet NCD policies including Health Japan 21 (Third Term) contain no environmental considerations despite demonstrated co-benefits.
- Environmental sustainability perspectives remain entirely absent from Japan's NCD policy frameworks despite successful integration models within MHLW. While the Strategic Initiative for a Healthy and Sustainable Food Environment demonstrates feasibility of health-environment policy integration, this approach has not extended to broader NCD strategies [77]. Initiatives such as Health Japan 21 (The Third Term), disease-specific promotion plans, Specific Health

Checkups, and cancer screenings seldom mention strategies for reducing the environmental impact of medical and health activities. The exclusion of healthcare from the government's Green Growth Strategy's 14 priority areas exemplifies the persistent policy silos that prevent comprehensive responses to interconnected challenges [251].

- Climate change intensifies NCD risks through multiple pathways, while adaptation measures remain fragmented and reactive. Rising temperatures heighten cardiovascular mortality and respiratory disease exacerbations due to heat stress and photochemical oxidant formation, yet knowledge gaps still exist regarding effects on children and patients with underlying conditions [31]. Current adaptation efforts focus on preventing acute heatstroke without addressing systemic vulnerabilities in NCD service delivery during extreme weather events. For areas lacking information, further research and surveys are necessary to develop scientifically based countermeasures.
- Climate change adaptation measures in healthcare yield co-benefits with NCD prevention & early intervention strategies. The government is actively enhancing measures to reduce health risks during extreme heat. The Ministry of the Environment and MHLW are both engaged in spreading information and raising awareness about heat illness prevention [256][260]. They are working with local governments and industries to cut heat-related deaths in half by 2030 [255]. Furthermore, the Ministry of the Environment keeps monitoring nationwide air pollutant levels and issues photochemical oxidant warnings [261], aiming to lessen health impacts caused by worsening air quality. These adaptation efforts support residents' health, including those with NCDS, and their sustained and intensified application remains essential.

KEY PERFORMANCE INDICATORS AND CURRENT MEASUREMENTS

- Healthcare sector GHG emissions: 6.4% of national total (2014) [28] – This indicator quantifies healthcare's substantial contribution to Japan's carbon footprint, ranking fourth globally and calls for urgent sector-specific decarbonisation strategies.
- Industry emission reduction progress: Pharmaceuticals -35.6%, Hospitals -22.6% versus 2013 baseline (2022) [29][30] – Progress toward 46% reduction targets by 2030 varies significantly across subsectors, with hospitals lagging substantially. The 24% non-participation rate among private hospitals undermines collective efforts to achieve these targets.
- Climate-related health impacts: 95,000+ heatstroke emergency transports, 1,500+ deaths (Summer 2018) [31] – These acute impacts represent only visible manifestations of climate-health risks, excluding unmeasured NCD exacerbations. Expanded use of comprehensive surveillance systems could capture broader climate impacts on chronic disease management and outcomes.

INDICATORS TO BE DEVELOPED IN THE FUTURE

- NCD-specific environmental impact metrics: Quantifying emissions, energy consumption, and waste generation related to the prevention, treatment, and care of NCDs would enable evidence-based resource allocation. Measuring the environmental footprints of dialysis, chemotherapy, and chronic respiratory support would identify the most impactful opportunities for intervention. These metrics would demonstrate environmental gains from prevention investments, strengthening the business cases for early intervention programmes.
- Environmental policy integration index: A systematic assessment of environmental considerations within health policy documents, planning processes, and evaluation frameworks would track progress in mainstreaming environmental considerations. Indicators could include the proportion of NCD policies that incorporate sustainability criteria, the participation of environmental experts in health committees, and joint health-environment budget allocations. Regular monitoring would ensure accountability for integration commitments. Such indicators would enable the tracking of progress in integrating healthcare and environmental policies.

- Climate-resilient healthcare facility assessment: Comprehensive indicators that assess facility-level climate preparedness such as BCP completion rates including climate risks, backup power capacity for essential NCD services, medication storage resilience, and staff training on climate-health protocols, can pinpoint vulnerable areas that need targeted support for adaptation investments.
- Evaluation indicators for the impact of climate change on NCDs: Indicators are essential for understanding how climate variables like temperature and rainfall influence NCDs. Data can reveal links, such as emergency transports for heart attacks during heatwaves or how climate affects HbA1c levels in diabetics. Combining weather data with NCD outcomes, like emergency admissions during extreme weather, improves data integration and helps identify correlations with health impacts. Stratifying by disease type and socioeconomic status enables targeted protection for vulnerable groups, while real-time monitoring facilitates predictive interventions.
- Evaluation indicators for the generation of medical waste and recycling rates: Developing indicators to track the volume of waste generated by healthcare is essential. These should include measures for overall waste production, recycling rates, and resource efficiency tailored to healthcare activities. Monitoring efforts like reducing single-use devices, minimising pharmaceutical waste, and adopting green procurement can gauge progress toward circular economy goals. Conducting life-cycle assessments of medical technologies will support sustainable purchasing decisions. Additionally, these indicators help evaluate the success of strategies aimed at lowering the healthcare sector's environmental impact, such as decreasing single-use plastics and encouraging green procurement.

RECOMMENDATIONS

1. Strengthening climate change adaptation measures: Perform vulnerability assessments of the healthcare system concerning climate change and create a roadmap for required actions based on the findings. Continuously monitor and assess the effectiveness of these actions. It is especially crucial to implement strategies to manage higher emergency transportation needs during heatwaves and to encourage the development of Business Continuity Plans (BCPs) for healthcare facilities that account for climate change risks.
2. Construction of integrated climate and health surveillance: Create a comprehensive surveillance system that links meteorological, environmental, and healthcare data to observe how climate change affects health and NCDs. Track the frequency of emergency transports and worsening chronic conditions during extreme weather events in real time, and leverage these insights to improve prevention strategies and bolster healthcare services.
3. Promotion of decarbonisation in the medical sector: Encourage medical institutions to adopt energy-efficient equipment and renewable energy sources, enhance operational efficiency through digital tech – like reducing unnecessary consultations and tests – and promote medical waste recycling. Establish green procurement standards, support eco-friendly product creation, and offer incentives like subsidies based on environmental performance during hospital renovations. This fosters active participation of all medical institutions in decarbonisation efforts.
4. Mainstreaming environmental considerations in policy formation: Include environmental sustainability in policy planning and evaluation for NCD countermeasures. Engage environmental specialists in disease councils and study groups to carry out environmental impact assessments during policy creation. Additionally, integrate strategies in NCD prevention that support both health and the environment, such as promoting walking, cycling, and healthy, low-impact diets. This encourages collaboration between healthcare and environmental sectors, drawing on international precedents such as the Sustainable Health Coalition and other cross-sectoral partnerships. Incorporating lessons from these initiatives can support the design of integrated policies tailored to Japan's context.

5. **Strengthening collaboration with international frameworks**: Share international insights via ATACH and incorporate strategies into Japan. Referencing the UK's NHS Net Zero Strategy and EU climate measures, develop decarbonisation and climate strategies tailored for Japan's health system.

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