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A Strategic Governance Framework for NFZ Performance, Accountability, and Resource Allocation in Poland's Public Healthcare System

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Abstract

Poland's public healthcare system faces pressures related to access, regional disparities, and resource allocation. This conceptual study develops the NFZ Strategic Governance Framework (NFZ-SGF), linking population need, allocation, purchasing, delivery, performance, diagnostic accountability, and subsequent decisions. A purposive synthesis of institutional and research sources is supplemented by a documented search of official 2024 data. An original 16-branch descriptive extraction pairs actual branch-executed health-service costs with insured persons, resident population, and counts of hospital-network (PSZ) services from NFZ reports. Branch expenditure totals PLN 132.26 billion, excluding PLN 48.09 billion executed centrally. Expenditure divided by year-end insured persons ranges from PLN 3,531 to PLN 4,224 (pooled ratio PLN 3,866); PSZ reported services per 1,000 insured range from 1,257 to 2,310. Across the 16 branches the two normalized series correlate at r = 0.583, an ecological association with no causal interpretation. These are administrative ratios, not need-adjusted funding estimates. Diagnostic accountability maps an adverse signal to a plausible mechanism and an actor able to correct it; investigative accountability assesses a possible breach. A contemporary source-screening audit identifies what was included and excluded while acknowledging that the earlier purposive search cannot be reconstructed. Three propositions specify prospective tests. NFZ-SGF remains unvalidated; age, morbidity, geography, and workforce cannot be jointly calibrated with the available regional series.

Keywords: diagnostic accountability, healthcare governance, National Health Fund, NFZ, performance management, Polish healthcare system, resource allocation, strategic purchasing

1. Introduction

Poland's public healthcare system faces increasing pressure to translate growing financial commitments into measurable improvements in accessibility, quality, equity, and long-term sustainability. The system is predominantly organised around social health insurance, with the National Health Fund (Narodowy Fundusz Zdrowia, NFZ) acting as the principal public purchaser of healthcare services, while the Ministry of Health retains responsibility for national policy, regulation, and system stewardship. Through its central administration and 16 regional branches, the NFZ finances and contracts healthcare services from public and private providers, positioning it at a critical interface between national health-policy objectives, population needs, healthcare providers, and public resource allocation (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Narodowy Fundusz Zdrowia, n.d.-c).

Despite developments in healthcare financing and organisation, persistent structural pressures remain. These include workforce constraints, hospital-sector financial pressures, waiting times and access limitations, regional disparities in healthcare capacity, and demographic ageing (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Dubas-Jakóbczyk et al., 2019; Dubas-Jakóbczyk & Kozieł, 2020; Dubas-Jakóbczyk et al., 2023; Dubas-Jakóbczyk et al., 2020; World Bank, 2021; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a). Consequently, the strategic challenge is not limited to mobilising additional

healthcare expenditure. It also concerns how available resources are allocated, translated into purchasing decisions, monitored through performance information, and connected to subsequent corrective action.

This perspective suggests that the NFZ should be analysed not solely as an administrative financing mechanism, but also through its potential role as a strategic purchaser. Strategic purchasing involves the deliberate use of information on population needs, provider capacity, service performance, costs, and healthcare objectives to inform what services are purchased, from whom, and under which arrangements (Mathauer et al., 2017; World Health Organization, 2019; WHO Regional Office for Europe, 2023; Figueras et al., 2005). In the Polish context, this raises a broader management question: whether resource allocation and purchasing decisions can be more systematically connected to population health needs, multidimensional performance, institutional accountability, and subsequent decision-making.

Such integration is particularly important because healthcare performance cannot be attributed to financing alone. Access, efficiency, quality, equity, and sustainability are jointly influenced by purchasing decisions, workforce availability, provider capacity, organisational performance, demographic conditions, and national policy (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Papanicolas et al., 2022; Dubas-Jakóbczyk et al., 2019; Dubas-Jakóbczyk & Kozieł, 2020; Dubas-Jakóbczyk et al., 2023; Dubas-Jakóbczyk et al., 2020; World Bank, 2021; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020). Performance information therefore requires interpretation before it can support managerial intervention. An adverse indicator may signal insufficient purchasing, provider inefficiency, workforce scarcity, demographic pressure, geographical constraints, or interactions among these factors.

Existing research provides substantial evidence on Polish healthcare financing, hospital organisation, workforce constraints, accessibility, regional variation, demographic pressures, and health-system performance (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Dubas-Jakóbczyk et al., 2019; Dubas-Jakóbczyk & Kozieł, 2020; Dubas-Jakóbczyk et al., 2023; Dubas-Jakóbczyk et al., 2020; World Bank, 2021; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020). Strategic-purchasing, performance-management, resource-allocation, and accountability literatures likewise provide established conceptual foundations (Papanicolas et al., 2022; Mathauer et al., 2017; World Health Organization, 2019; WHO Regional Office for Europe, 2023; Figueras et al., 2005; Smith et al., 2001; Smith, 2008; Brinkerhoff, 2004; Brinkerhoff et al., 2017; Vian, 2020; Mathauer & Dkhimi, 2019; Hawkins, 2017). However, these dimensions are commonly analysed separately. The resulting research gap is therefore one of strategic integration: a clearer management architecture is needed to connect population health needs, resource allocation, NFZ purchasing, healthcare delivery, multidimensional performance measurement, institutional responsibility, and subsequent resource decisions within a continuous governance cycle.

The contribution is a specific decision sequence, not a claim that the NFZ lacks purchasing or monitoring functions. It asks how needs evidence changes purchasing, how subsequent outcomes trigger a mechanism-specific diagnosis, and how that diagnosis identifies an actor able to act. Polish regional variation is central: the same waiting-time signal can arise from a shortage of contracts, available staff, geographic capacity, or provider scheduling, each implying a different institutional response.

Accordingly, this study addresses the following principal research question:

RQ: How can Poland's National Health Fund integrate performance measurement, institutional accountability, and resource allocation within a unified strategic management framework?

Three supporting research questions structure the analysis:

RQ1: Which dimensions should define NFZ performance beyond expenditure and contractual compliance?

RQ2: How can resource-allocation decisions be more systematically connected to population health needs and measurable healthcare-system pressures?

RQ3: Which accountability and feedback mechanisms can strengthen the relationship between NFZ purchasing decisions and provider and system performance?

To address these questions, the study develops the NFZ Strategic Governance Framework (NFZ-SGF), conceptualising healthcare governance as an iterative sequence:

Population Health Needs → Needs-Sensitive Resource Allocation → Strategic Purchasing → Healthcare Delivery → Multidimensional Performance Measurement → Institutional Accountability → Strategic Feedback and Reallocation.

NFZ-SGF evaluates performance across five complementary dimensions—access, efficiency, quality, equity, and sustainability—and conceptualises resource allocation through population, demographic structure, morbidity,

socioeconomic need, workforce capacity, and utilisation or accessibility pressure. The framework further introduces diagnostic accountability, defined as the assignment of corrective responsibility to the institutional level possessing both the authority and practical capacity to influence the mechanism underlying an identified performance problem.

The study makes a conceptual and managerial rather than causal contribution. It does not propose an operational NFZ funding algorithm, rank the 16 regional branches, or claim that implementation of NFZ-SGF would generate predetermined healthcare outcomes. Instead, it develops an institutionally contextualised and empirically testable architecture through which existing information, purchasing functions, performance measures, and institutional responsibilities can be organised into a continuous strategic governance cycle.

The remainder of the article is structured as follows. Section 2 reviews the theoretical and institutional foundations of strategic purchasing, multidimensional performance management, accountability, and needs-sensitive resource allocation. Section 3 presents the conceptual-analytical methodology. Section 4 develops the NFZ-SGF and its performance, allocation, purchasing, accountability, and feedback components. Section 5 discusses theoretical and policy implications, Section 6 identifies limitations and priorities for empirical validation, and Section 7 concludes.

2. Literature Review and Institutional Context

2.1 Healthcare Governance and Multidimensional Performance

Healthcare governance concerns the institutional arrangements through which objectives are established, resources are allocated, responsibilities are distributed, performance is assessed, and corrective decisions are made. In publicly financed health systems, these functions are distributed among ministries, purchasing agencies, regional authorities, providers, managers, and clinical professionals, making performance the product of multiple interacting institutional mechanisms rather than the responsibility of a single actor (Papanicolas et al., 2022; Brinkerhoff, 2004; Brinkerhoff et al., 2017).

Health-system performance should consequently not be assessed through expenditure or service activity alone. Contemporary performance-assessment frameworks incorporate multiple dimensions, including access, efficiency, quality, equity, responsiveness, and system resilience or sustainability (Papanicolas et al., 2022). These dimensions may generate competing signals: increased activity can improve access while intensifying workforce pressure; expenditure reductions may reflect efficiency gains or constrained capacity; and concentration of specialised services may improve technical efficiency while creating geographical barriers.

This multidimensional perspective is particularly relevant to Poland, where healthcare performance is shaped by workforce constraints, demographic ageing, regional differences in capacity, hospital-sector organisation and financial pressures, and persistent accessibility challenges (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Dubas-Jakóbczyk et al., 2019; Dubas-Jakóbczyk & Kozieł, 2020; Dubas-Jakóbczyk et al., 2023; Dubas-Jakóbczyk et al., 2020; World Bank, 2021; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020). Performance indicators must therefore be interpreted in relation to population need, provider capacity, workforce availability, financing, and organisational conditions rather than treated as isolated measures of institutional success or failure.

For strategic management purposes, performance information becomes valuable when it supports subsequent decisions. The relevant function is therefore not merely measurement, but the translation of performance evidence into diagnosis, resource allocation, purchasing decisions, and corrective action (Papanicolas et al., 2022; Brinkerhoff, 2004).

2.2 Strategic Purchasing and the Institutional Role of the NFZ

Strategic purchasing provides the principal theoretical connection between healthcare financing and performance. WHO approaches strategic purchasing as the deliberate use of information on population needs, provider performance, service quality, costs, and available resources to determine what services should be purchased, from whom, and under which contractual or payment arrangements (Mathauer et al., 2017; World Health Organization, 2019; WHO Regional Office for Europe, 2023; Figueras et al., 2005).

This differs from predominantly passive purchasing based on historical budgets, existing provider structures, or retrospective reimbursement. Strategic purchasing positions the purchaser between health-policy objectives and operational healthcare delivery and requires information to influence resource use and provider relationships (Mathauer et al., 2017; World Health Organization, 2019; WHO Regional Office for Europe, 2023; Figueras et al., 2005; Hawkins, 2017).

Provider-payment mechanisms are nevertheless context dependent. Different arrangements generate different incentives concerning activity, efficiency, quality, provider behaviour, and resource distribution (Eijkenaar et al., 2013;

Eijkenaar, 2012; Barasa et al., 2021; Kachapila et al., 2023; Mathauer & Dkhimi, 2019). Evidence on pay-for-performance demonstrates heterogeneous effects and cautions against assuming that financial incentives automatically improve all dimensions of healthcare performance (Eijkenaar et al., 2013; Eijkenaar, 2012). Mixed payment systems may therefore remain appropriate where services differ in complexity, predictability, clinical risk, provider control over outcomes, and measurability (Barasa et al., 2021; Mathauer & Dkhimi, 2019).

This distinction is important for Poland. The NFZ is the principal public purchaser of healthcare services and operates through central administration and 16 regional branches responsible for financing, contracting, monitoring contractual implementation, and settling publicly financed healthcare activity (Sowada et al., 2019; Sowada et al., 2024; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a). The Ministry of Health retains responsibility for national policy, regulation, and strategic direction, while service delivery is undertaken through a heterogeneous provider sector (Sowada et al., 2019; Sowada et al., 2024).

NFZ purchasing consequently operates within a multi-level governance environment affected by workforce shortages, demographic change, regional variation, hospital financial pressures, and historically developed provider structures (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Dubas-Jakóbczyk et al., 2019; Dubas-Jakóbczyk & Kozieł, 2020; Dubas-Jakóbczyk et al., 2023; Dubas-Jakóbczyk et al., 2020; World Bank, 2021; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a). Polish hospital reforms illustrate these interdependencies: changes in financing and organisational arrangements have repeatedly interacted with provider capacity, institutional implementation, financial sustainability, and broader structural conditions (Dubas-Jakóbczyk et al., 2019; Dubas-Jakóbczyk & Kozieł, 2020; Dubas-Jakóbczyk et al., 2023; Dubas-Jakóbczyk et al., 2020; World Bank, 2021).

Conceptualising NFZ as a strategic purchaser therefore does not imply that existing purchasing functions are passive or absent. Rather, the analytical question is whether existing financing, contracting, monitoring, and information capabilities can be connected more systematically to population need, provider capacity, multidimensional performance, and subsequent purchasing decisions.

2.3 Needs-Sensitive Resource Allocation and Diagnostic Accountability

Public purchasers operate under finite budgets and must allocate resources across populations, regions, services, and providers characterised by different levels of healthcare need and service capacity. Allocation therefore involves both technical and normative choices concerning efficiency, access, equity, and public value (Smith et al., 2001; Smith, 2008).

Population size provides an important allocation basis, but equal per-capita funding does not necessarily correspond to equal healthcare need. Age structure, morbidity, socioeconomic conditions, geographical characteristics, and other determinants influence expected demand and healthcare costs (Smith et al., 2001; Smith, 2008). The distinction between need and utilisation is especially important. Low utilisation may reflect limited healthcare need, but it may also indicate waiting times, workforce shortages, geographical barriers, or inadequate provider capacity. Conversely, high utilisation can reflect greater need, greater supply, inefficient pathways, or combinations of these factors.

These distinctions have direct relevance to Poland. Population ageing is expected to alter future healthcare demand, while current evidence identifies workforce constraints, accessibility pressures, and regional variation in healthcare resources and service availability (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020). Historical expenditure and observed activity alone may therefore provide an incomplete representation of regional resource requirements.

Needs-sensitive allocation should consequently distinguish among population need, available healthcare capacity, and observed utilisation. Allocation formulas may incorporate demographic and health-need information, but their construction requires explicit policy choices, reliable data, risk adjustment, and assessment of distributional consequences (Smith et al., 2001; Smith, 2008). Accordingly, the present study identifies relevant information domains rather than imposing predetermined numerical weights.

Resource allocation and purchasing also require accountability. Health-system accountability concerns the obligation to explain and justify decisions, demonstrate appropriate use of authority and resources, and respond where responsibilities are not fulfilled (Brinkerhoff, 2004; Brinkerhoff et al., 2017; Vian, 2020). Financial accountability, performance accountability, and outcome accountability nevertheless represent distinct concepts. An institution may satisfy financial and contractual obligations while accessibility remains poor, and an adverse regional outcome may result from purchasing decisions, provider performance, workforce shortages, demographic pressures, geographical constraints, national policy, or interactions among these factors.

Transparency can make allocation principles, purchasing objectives, indicators, and decision processes more visible (World Health Organization, 2019; Brinkerhoff et al., 2017; Vian, 2020; Hawkins, 2017), but transparency alone cannot establish responsibility. Accountability must also reflect institutional authority and practical capacity to intervene.

Conventional public-sector accountability emphasises answerability, transparency, oversight, and an obligation to justify decisions (Brinkerhoff, 2004; Brinkerhoff et al., 2017; Vian, 2020). These concepts do not necessarily identify the actor able to correct the particular mechanism underlying a poor indicator. Diagnostic accountability is complementary: financing, contracting, regulation, provider operations, and clinical care can involve different authorities, so the appropriate corrective actor depends on the diagnosed mechanism. The diagnosis may identify shared responsibility and must remain open to revision when evidence is weak.

The present study therefore defines diagnostic accountability as:

the assignment of corrective responsibility to the institutional level possessing both the authority and practical capacity to influence the mechanism underlying an identified performance problem.

Diagnostic accountability differs from automatic attribution based on performance indicators. It requires identification of the problem, examination of plausible mechanisms, and determination of which institution possesses appropriate corrective capacity. This distinction is particularly relevant in Poland because authority is distributed among the Ministry of Health, NFZ central administration, NFZ regional branches, providers, organisational management, and clinical professionals (Sowada et al., 2019; Sowada et al., 2024; Narodowy Fundusz Zdrowia, n.d.-c).

Principal-agent theory (Jensen & Meckling, 1976) explains why a public purchaser needs observable commitments and monitoring when providers possess better information about effort and quality. Stewardship theory (Davis et al., 1997) adds that clinicians and managers may also act on professional and public-service goals, so correction need not begin with sanction. Resource-dependence theory (Pfeffer & Salancik, 1978) explains why an NFZ branch cannot purchase capacity that is absent locally and why providers respond to several funding and workforce constraints. New public management (Hood, 1991) contributes explicit targets and measurement, but targets alone can misidentify the cause of shortfalls or reward gaming. Together these lenses justify a sequence: specify the observed signal; investigate the competing mechanisms and incentives; identify whether contracting, provider management, regulation, or workforce policy controls the constraint; and select and review a proportionate corrective action. This is an interpretive integration, not an empirical test of the four theories.

Investigative accountability is distinct from that sequence. Investigation establishes facts concerning a suspected breach and can support explanation or sanction; diagnostic accountability examines the causal pathways behind an outcome and assigns feasible corrective responsibility, which can be shared even when no wrongdoing occurred. If investigation uncovers misconduct it informs diagnosis, but an adverse regional indicator alone is not evidence of a breach.

The mechanism is a sequence of (i) defining a performance signal with its denominator and time window, (ii) comparing plausible demand, supply, purchasing, and organisational explanations, (iii) documenting the strength and uncertainty of each explanation, (iv) mapping the actionable mechanism to an institution's legal authority and feasible capacity, and (v) assigning a review date and a measurable corrective action. If the evidence cannot distinguish mechanisms, attribution remains provisional or shared. This does not replace existing legal or financial answerability.

Table 1. Diagnostic Accountability and Related Concepts

Concept	Question and unit	What it cannot establish alone	Addition in NFZ-SGF
Financial accountability	Was spending and reporting compliant?	Whether an access problem was caused by funding or capacity.	Diagnoses the mechanism before assigning corrective action.
Performance accountability	Was a specified target met?	Whether the target holder controls the causal constraint.	Maps an adverse signal to authority and practical capacity.
Answerability and oversight	Who must explain a decision to whom?	Which actor can remedy a cross-institutional problem.	Links the explanation to a feasible intervention and review.
Investigative accountability	Is there evidence warranting scrutiny of misconduct or a breach?	Whether the investigated actor can remedy every source of a poor outcome.	Keeps fact-finding and possible sanction separate from diagnosis of corrective authority.
Diagnostic accountability	Which mechanism produced the signal, and who can change it?	It does not itself identify causal effects without suitable evidence.	Makes attribution provisional, shared, and revisable when evidence is weak.

2.4 Conceptual Integration and Research Gap

The literature identifies four complementary governance functions. Performance assessment provides multidimensional evidence on healthcare activity and outcomes (Papanicolas et al., 2022); strategic purchasing connects financing with population needs and provider behaviour (Mathauer et al., 2017; World Health Organization, 2019; WHO Regional Office for Europe, 2023; Figueras et al., 2005; Mathauer & Dkhimi, 2019; Hawkins, 2017); resource allocation distributes finite resources across heterogeneous populations and service environments (Smith et al., 2001; Smith, 2008); and accountability establishes responsibility for decisions and corrective action (Brinkerhoff, 2004; Brinkerhoff et al., 2017; Vian, 2020).

Polish evidence also reveals why those functions must be considered together. Zienkiewicz and colleagues (Zienkiewicz et al., 2018) found that regional accessibility did not follow a simple linear gradient in socioeconomic development or urbanisation; provider and contracting resources mattered. Więckowska et al. (2024) documented substantial within- and between-region differences in local health programmes. Piekut and Pacian (Piekut & Pacian, 2026) combined infrastructural, household, and financial indicators to study regional variation in coordinated care. These studies analyse different populations, periods, and outcomes; none isolates the causal effect of NFZ purchasing. Together they challenge an inference from an isolated regional indicator to a single responsible actor.

Individually, however, these functions are insufficient. Performance information without decision authority may remain retrospective reporting. Purchasing without needs-sensitive allocation may reproduce historical resource patterns. Allocation without performance feedback provides limited evidence on whether resources generate intended effects. Accountability without diagnosis risks assigning responsibility to institutions unable to influence the underlying mechanism.

Polish healthcare research and institutional evidence already provide substantial analysis of health-system organisation, NFZ structures, hospital reform, financial sustainability, healthcare resources, workforce pressures, demographic change, access, and system performance (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Dubas-Jakóbczyk et al., 2019; Dubas-Jakóbczyk & Kozieł, 2020; Dubas-Jakóbczyk et al., 2023; Dubas-Jakóbczyk et al., 2020; World Bank, 2021; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a). The research gap is therefore not an absence of evidence

concerning the Polish healthcare system, but the limited integration of these components into a continuous NFZ-level strategic management architecture.

The conceptual relationship addressed in this study is:

Population Health Needs → Needs-Sensitive Resource Allocation → Strategic Purchasing → Healthcare Delivery → Multidimensional Performance Measurement → Diagnostic Accountability → Strategic Feedback and Reallocation

The NFZ-SGF integrates these functions without assuming that existing NFZ structures must be replaced or that an immediately operational funding algorithm can be derived from the available evidence. Instead, it provides a conceptual architecture through which existing and future information, purchasing mechanisms, performance indicators, and institutional responsibilities can be organised into a testable strategic governance cycle.

3. Materials and Methods

3.1 Research Design

This study uses a structured, purposive conceptual synthesis. Its main unit of analysis is the governance architecture around NFZ purchasing; documentary observations are institutional sources and published studies. A distinct supplementary descriptive extraction uses all 16 NFZ branches as units, pairing actual 2024 health-service costs from the NFZ plan-execution report (Narodowy Fundusz Zdrowia, 2025b), year-end insured counts (Table III.5), midyear residents (Table IV.22), and counts of services reported in the hospital-network PSZ system (Table II.1) from the 2024 activity report (Narodowy Fundusz Zdrowia, 2025a). The sources are joined by named branch and year; the published numerators refer to different accounting scopes and denominators. No individual-level data, regional regression, quasi-experiment, or systematic review is claimed.

The study does not estimate the causal effect of a specific NFZ intervention or evaluate individual hospitals or regional branches. Its unit of analysis is the system-level governance architecture surrounding NFZ purchasing and resource stewardship. The methodological design combines four components: (1) institutional analysis of NFZ responsibilities and the Polish healthcare system (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a); (2) secondary indicator mapping of healthcare need, capacity, utilisation, accessibility, and performance (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Papanicolas et al., 2022; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020); (3) policy benchmarking against established health-system performance and strategic-purchasing principles (Papanicolas et al., 2022; Mathauer et al., 2017; World Health Organization, 2019); and (4) conceptual integration of these components into the NFZ Strategic Governance Framework (NFZ-SGF).

Accordingly, NFZ-SGF is treated as a theoretically grounded and institutionally contextualised framework requiring subsequent empirical validation rather than as an empirically validated intervention.

3.2 Evidence Base and Selection

The analysis uses exclusively publicly available secondary evidence. No patient-level records, individual claims, confidential NFZ administrative microdata, or confidential provider-level datasets were accessed.

Polish evidence was drawn principally from the NFZ, Statistics Poland (GUS), Polish healthcare-system assessments, and publicly available policy and institutional documentation (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Statistics Poland, 2025; Statistics Poland, 2023; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a). International comparative and conceptual evidence was obtained from the OECD, WHO, European Observatory on Health Systems and Policies, and related European health-system sources (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Papanicolas et al., 2022; Mathauer et al., 2017; World Health Organization, 2019; OECD, 2025a; OECD, 2020). Peer-reviewed literature provided the theoretical foundations for strategic purchasing, resource allocation, provider incentives, performance management, and accountability.

Evidence was selected purposively according to three criteria:

1. Institutional relevance - direct relevance to healthcare financing, purchasing, provision, population need, performance, accountability, or resource allocation;
2. Comparability - capacity, where available, to support regional, temporal, or international comparison; and

3. Managerial interpretability - potential to inform allocation, purchasing, performance assessment, accountability, or corrective decision-making.

Sources were identified iteratively through targeted searches of institutional repositories and academic databases using combinations of terms related to Poland, NFZ, strategic purchasing, health-system performance, resource allocation, provider payment, accountability, healthcare access, workforce capacity, and regional variation. Priority was given to authoritative institutional sources, peer-reviewed conceptual or empirical studies directly relevant to the framework components, and recent Polish health-system evidence. Reference chaining from key WHO, OECD, European Observatory, and peer-reviewed sources was subsequently used to identify additional relevant literature.

Search and selection record. The source audit concluded in August 2026. Searches combined "Poland" or "NFZ" with "resource allocation", "strategic purchasing", "waiting times", "regional access", "workforce", "provider payment", and "accountability"; WHO, OECD, the European Observatory, NFZ, and Statistics Poland repositories and reference lists were searched. Relevance was assessed against Polish institutional functions, conceptual constructs needed by the framework, and decision-relevant health-system measures. Foundational international sources were retained where they defined purchasing, allocation, performance, or accountability. This was iterative and purposive; search dates, hit counts, duplicate removal, screening records, excluded-source logs, and formal quality scores were not preserved. It is therefore not reproducible as a systematic review, and no PRISMA flow is asserted.

Post-review verification audit (25 September 2026). A separate, dated search queried official NFZ BIP activity, finance and board-resolution pages using Polish terms "sprawozdanie", "wykonanie planu finansowego", "2024", "oddziały wojewódzkie", "koszty świadczeń", and "ubezpieczeni"; the exact included records, source tables, and reasons for rejecting alternatives are retained in the accompanying screening record. Inclusion required official provenance, a published 2024 observation, a definition applicable to all 16 named branches, and an explicit unit and accounting period. Planned allocations were excluded as substitutes for expenditure; national-only totals, annual flow versus point-in-time denominators, and service categories without an aligned counterpart were not combined as equivalent measures. This audit is reproducible for these official data sources but does not reconstruct the initial literature searches, supply a full screened bibliography, or justify a PRISMA claim.

Source appraisal for the supplementary extraction prioritised official administrative reports over commentary and checked three published totals: the 16 branch costs sum to PLN 132,260,404.85 thousand (Narodowy Fundusz Zdrowia, 2025b), the insured counts sum to 34,212,349, and reported PSZ services sum to 58,350,938 (Narodowy Fundusz Zdrowia, 2025a). Residual risks include single-author screening, selective availability, service-count coding, branch-versus-residence attribution, and the mismatch between annual flows and point-in-time population. These checks assess transcription and fit, not causal validity or the quality of every cited conceptual source.

The procedure was framework-oriented rather than a systematic literature review. Sources were selected to establish institutional context, support the principal governance constructs, identify decision-relevant indicator domains, and inform development of NFZ-SGF.

3.3 Analytical Dimensions and Indicator Mapping

The analytical architecture distinguishes three levels:

System Inputs and Pressures → Governance and Purchasing Mechanisms → Healthcare-System Performance

System inputs and pressures include demographic, epidemiological, socioeconomic, workforce, utilisation, accessibility, and provider-capacity conditions (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020). Governance mechanisms include resource allocation, purchasing, contracting, performance monitoring, accountability, and strategic feedback (Papanicolas et al., 2022; Mathauer et al., 2017; World Health Organization, 2019; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a).

Healthcare-system performance is organised across five complementary dimensions: access, efficiency, quality, equity, and sustainability (Papanicolas et al., 2022; OECD, 2025a). Indicators are additionally classified according to whether they primarily represent need, capacity, activity/utilisation, accessibility pressure, or performance.

This distinction is methodologically important because observed utilisation does not necessarily represent underlying healthcare need. Low utilisation may reflect lower demand, but it may also result from waiting times, geographical barriers, provider scarcity, or workforce constraints (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; OECD, 2025a; OECD, 2020).

Table 2. Analytical Dimensions and Indicative Measures for NFZ Strategic Governance

Analytical Dimension	Indicative Measures	Governance Function
Population Need	Population size, age structure, morbidity burden	Estimate underlying healthcare demand
Access	Waiting times, unmet need, geographical availability	Identify barriers to healthcare access
Efficiency	Utilisation, cost per episode, resource productivity	Assess conversion of resources into services
Quality	Readmissions, selected outcomes, avoidable mortality, continuity measures	Evaluate quality of purchased care
Equity	Regional variation adjusted for healthcare need	Identify territorial disparities
Sustainability	Workforce capacity, expenditure trends, demographic pressure	Assess long-term system resilience
Accountability	Contract compliance, reporting, performance review	Connect institutional responsibility with observed performance

The measures are indicative rather than operationally validated NFZ indicators. Any operational dashboard would require subsequent assessment of data availability, reliability, geographical resolution, comparability, risk adjustment, and managerial relevance.

The indicator table distinguishes five performance domains from two supporting governance domains. Population need supplies upstream information for allocation; accountability is a downstream function connecting a performance signal with a plausible corrective actor. Neither is counted as an additional performance outcome. The illustrative measures require validation of definitions, geography, risk adjustment, timeliness, and susceptibility to strategic reporting before operational use.

3.4 Framework Development Procedure

NFZ-SGF was developed through four sequential analytical stages.

Coding and adjudication. Each retained source was assigned to one or more of the need, capacity, utilisation, access, purchasing, performance, accountability, and feedback domains. The proposed component was retained only when it related to an NFZ decision or to an explicit external constraint on that decision. Contradictory interpretations were recorded as competing mechanisms rather than resolved by a numerical vote. Because the synthesis was conducted by one author without an independently coded sample, interpretive and selection bias remain possible.

Stage 1 — Institutional and System Diagnosis. The institutional position of NFZ and structural conditions influencing healthcare purchasing and performance were mapped using Polish institutional and comparative evidence (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Sowada et al., 2019; Sowada et al., 2024; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a). Differences in expenditure, access, workforce, utilisation, or outcomes were treated as diagnostic signals requiring interpretation, rather than automatic evidence of purchaser or provider inefficiency.

Stage 2 — Performance and Need Mapping. Evidence was classified across the five performance domains—access, efficiency, quality, equity, and sustainability—and simultaneously distinguished as representing need, capacity, activity, accessibility pressure, or performance (Papanicolas et al., 2022; OECD, 2025a; OECD, 2020). This dual classification prevents observed service activity from being treated automatically as healthcare need.

Stage 3 — Governance and Accountability Mapping. Institutional responsibility was mapped across the Ministry of Health, NFZ central administration, NFZ regional branches, healthcare providers, organisational management, and

clinical actors (Sowada et al., 2019; Sowada et al., 2024; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a). Three forms of accountability were distinguished: financial accountability, concerning appropriate use of public resources; performance accountability, concerning specified service or organisational objectives; and outcome accountability, concerning contributions to broader health-system objectives within the limits of institutional authority.

Corrective responsibility was then assigned according to the principle of diagnostic accountability: attribution should correspond to the actor possessing both authority and practical capacity to influence the identified mechanism.

Stage 4 — Strategic Integration. The preceding components were integrated into a continuous governance architecture:

Population Health Needs → Needs-Sensitive Resource Allocation → Strategic Purchasing → Healthcare Delivery → Multidimensional Performance Measurement → Diagnostic Accountability → Strategic Feedback → Reallocation

The temporal logic can be represented as:

Allocation (t) → Purchasing (t) → Delivery (t) → Performance (t) → Evaluation (t) → Allocation (t+1)

where *t* represents the current planning period and *t+1* the subsequent allocation period. This relationship represents a strategic feedback mechanism, not an automatically executing funding rule. Performance evidence requires institutional interpretation before subsequent purchasing or allocation decisions are modified.

3.5 Methodological Boundaries

The methodology establishes several boundaries relevant to interpretation. First, the study is conceptual and does not estimate causal relationships between NFZ decisions and healthcare outcomes. Second, no numerical weights are assigned to the proposed resource-allocation or performance components. Third, secondary indicators from different institutional sources may vary in definition, reporting period, geographical resolution, and comparability. Finally, NFZ-SGF represents a framework for subsequent empirical testing rather than an operational funding algorithm.

Empirical validation should therefore examine the framework using regional NFZ data, provider-level performance information, longitudinal indicators, and alternative allocation specifications before operational implementation is considered.

4. NFZ-SGF Framework and Analytical Propositions

4.1 From Fragmented Indicators to Strategic Governance

The analysis identified a central governance problem: healthcare financing, population need, purchasing, provider activity, performance measurement, and institutional accountability are analytically related but are not necessarily organised as a continuous strategic management cycle. NFZ-SGF addresses this fragmentation by connecting these functions within a single governance architecture.

The framework is based on five interdependent performance domains: access, efficiency, quality, equity, and sustainability. These dimensions should not be interpreted independently. For example, improvements in efficiency that reduce geographical accessibility may generate adverse equity effects, while expansion of service capacity may improve access but create additional workforce or financial pressure.

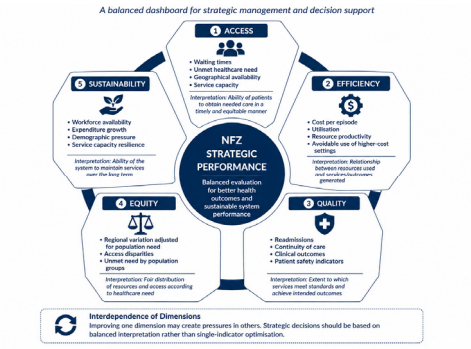


Figure 1. Five-Dimensional Architecture of NFZ Performance

The analytical implication is that NFZ performance assessment should combine these dimensions rather than optimise one in isolation.

4.2 NFZ Strategic Governance Framework

The principal result of the study is the NFZ Strategic Governance Framework (NFZ-SGF). The framework integrates seven governance components:

Healthcare delivery is an intermediate system process, not a function directly controlled by the NFZ. Purchasing and contracting can change conditions of delivery, while service organisation and clinical decisions remain primarily with providers. Delivery is included because it is the transmission step through which purchasing may influence observable outcomes, subject to capacity and other external constraints.

1. population health needs;
2. needs-sensitive resource allocation;
3. strategic purchasing;
4. healthcare delivery;
5. multidimensional performance measurement;
6. diagnostic accountability; and
7. strategic feedback and reallocation.

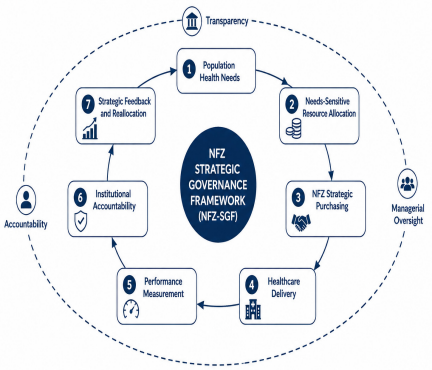


Figure 2. NFZ Strategic Governance Framework (NFZ-SGF)

As illustrated in Figure 2, NFZ-SGF is deliberately circular rather than linear. Population needs inform resource-allocation priorities; allocated resources determine purchasing capacity; purchasing influences healthcare delivery; delivery generates measurable performance; performance evidence supports accountability and diagnosis; and this information can subsequently inform purchasing and allocation decisions.

The temporal relationship is expressed as:

$$\text{Allocation}(t) \rightarrow \text{Purchasing}(t) \rightarrow \text{Delivery}(t) \rightarrow \text{Performance}(t) \rightarrow \text{Evaluation}(t) \rightarrow \text{Allocation}(t+1)$$

The transition from t to $t+1$ represents the strategic feedback mechanism at the centre of NFZ-SGF.

The framework therefore changes the managerial function assigned to performance information. Rather than functioning primarily as retrospective evidence of completed healthcare activity, performance information becomes potential decision support for subsequent purchasing and resource governance. This feedback relationship is not automatic: performance evidence requires institutional interpretation before corrective action is selected.

4.3 Needs-Sensitive Resource Allocation

The resource-allocation component of NFZ-SGF addresses the distinction between population size, healthcare need, available capacity, and observed utilisation. Allocation based predominantly on historical expenditure or activity may reproduce existing service patterns without establishing whether these patterns correspond to underlying healthcare need.

The proposed architecture incorporates six information domains:

- population size and distribution (P);

- age structure (A);
- morbidity and epidemiological burden (M);
- socioeconomic need (D);
- workforce and provider capacity (W); and
- utilisation and accessibility pressure (U).

For region *r*, the conceptual relationship can be represented as:

$$RA(r) = f[P(r), A(r), M(r), D(r), W(r), U(r)]$$

where RA_r represents the resource-allocation requirement for region *r*. The expression is a conceptual relationship rather than an estimated funding formula. No numerical weights are assigned to the six components.

Table 3. Conceptual Components of Needs-Sensitive NFZ Resource Allocation

Component	Indicative Information	Strategic Interpretation
Population (P)	Population size, distribution	Baseline service requirement
Age Structure (A)	Older population, dependency structure	Demographic pressure
Morbidity (M)	Disease burden, chronic conditions	Epidemiological need
Socioeconomic Need (D)	Income, deprivation, unemployment	Social determinants and vulnerability
Workforce & Capacity (W)	Physicians, nurses, beds, provider capacity	Ability to convert funding into services
Utilisation & Access Pressure (U)	Activity, waiting times, unmet need, geographical access	Observed demand and accessibility constraints

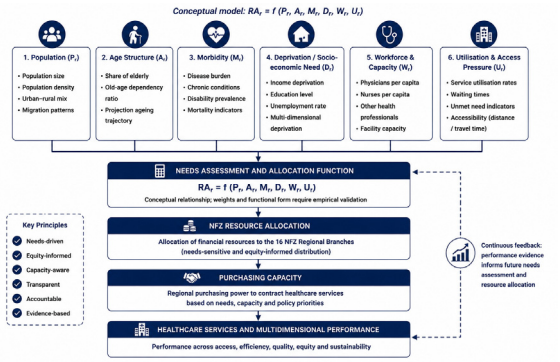


Figure 3. Needs-Sensitive NFZ Resource Allocation Architecture

Figure 3 illustrates how these six information domains can inform needs assessment, regional resource allocation, and subsequent purchasing capacity. Importantly, the final stage represents Healthcare Services and Multidimensional Performance, not a predetermined improvement in healthcare outcomes.

This distinction is necessary because the framework does not establish a causal relationship between needs-sensitive allocation and improved access, quality, equity, efficiency, or sustainability. Rather, these dimensions constitute performance domains against which subsequent healthcare-system activity can be assessed.

A central implication is that utilisation should not be treated automatically as need. Low utilisation may indicate lower healthcare demand, but it may also reflect waiting times, workforce shortages, geographical barriers, or insufficient

provider capacity. Conversely, high utilisation may represent greater healthcare need, greater supply, inefficient pathways, or combinations of these mechanisms.

Indicators used in allocation also create potential reporting incentives. Where published utilisation, waiting times, or provider activity influence budget decisions, reported values should be audited independently, cross-checked against other data sources, and compared over time. Need, current capacity, and utilisation must remain analytically distinct. Efficiency and equity may imply different priorities: placing resources where capacity is strong can raise immediate output, while strengthening underserved areas may improve territorial access. Weights between those objectives are policy choices requiring transparent deliberation rather than a purportedly neutral formula.

The allocation architecture therefore supports needs-sensitive rather than utilisation-driven interpretation, while leaving the empirical specification and weighting of individual components to subsequent validation.

Endogeneity is an empirical problem, not something resolved by triangulation alone. Current spending can expand local supply and recorded utilisation; supply can affect waiting times and diagnosis rates; and unmet need may depress observed use. The expression $RA_r = f(P_r, A_r, M_r, D_r, W_r, U_r)$ therefore specifies candidate information rather than causal coefficients. A future design would first separate expenditure by care category and purchasing branch, align resident populations and years, and compare age-adjusted need and workforce capacity with observed activity. A within-region panel with region and year effects could describe associations but cannot by itself remove time-varying confounding. Instrumental variables would require a defensible exclusion restriction; a discontinuity design would require an actual threshold and evidence against manipulation. Neither design is asserted as feasible here. Sensitivity analyses should compare need proxies and exclude supply-dependent utilisation from alternative specifications.

4.4 Strategic Purchasing and Performance Linkage

Within NFZ-SGF, resource allocation determines purchasing capacity but does not by itself determine healthcare performance. The intermediate managerial mechanism is strategic purchasing.

The proposed purchasing architecture connects four questions:

What should be purchased? → For whom? → From which providers? → Under which contractual and payment conditions?

Purchasing decisions can consequently draw on population need, provider capacity, accessibility constraints, historical performance, quality information, and financial sustainability (Mathauer et al., 2017; World Health Organization, 2019; WHO Regional Office for Europe, 2023; Figueras et al., 2005; Eijkenaar et al., 2013; Eijkenaar, 2012; Barasa et al., 2021; Kachapila et al., 2023; Mathauer & Dkhimi, 2019; Hawkins, 2017).

NFZ-SGF does not prescribe a single provider-payment mechanism. Different services and provider environments may require different combinations of payment methods, contractual incentives, monitoring, and performance expectations. The framework instead establishes a principle: purchasing decisions should be interpretable in relation to explicit needs and performance objectives and subsequently assessable through multidimensional evidence.

This creates a managerial chain:

Allocation → Purchasing Capacity → Contracting and Payment → Healthcare Delivery → Performance Evidence

Performance information can then inform subsequent purchasing decisions without implying that provider remuneration should mechanically respond to individual indicators.

4.5 Diagnostic Accountability

The accountability component constitutes a second central contribution of NFZ-SGF. Performance differences do not automatically identify the institution responsible for correcting them. A waiting-time problem, for example, may result from insufficient purchasing capacity, regional contracting decisions, provider organisation, workforce scarcity, referral pathways, geographical constraints, or national policy.

NFZ-SGF therefore applies diagnostic accountability, defined as:

the assignment of corrective responsibility to the institutional level possessing both the authority and practical capacity to influence the mechanism underlying an identified performance problem.

The analytical sequence is:

Performance Signal → Diagnostic Assessment → Mechanism Identification → Institutional Responsibility → Corrective Action

Table 4. NFZ strategic accountability matrix

Institutional Level	Principal Responsibility	Indicative Corrective Capacity
Ministry of Health	National policy, regulation, system stewardship	Regulation, national strategy, workforce and structural policy
NFZ Central	National purchasing architecture and resource stewardship	Allocation principles, purchasing standards, national performance governance
NFZ Regional Branches	Regional purchasing and contracting	Contract volumes, provider mix, regional purchasing priorities
Healthcare Providers	Service organisation and delivery	Operational processes, capacity use, quality improvement
Organisational Management	Internal resource and performance management	Staffing, workflows, operational corrective action
Clinical Actors	Clinical delivery within professional authority	Clinical processes and appropriate care pathways

The matrix does not imply exclusive responsibility. Many healthcare-system problems are produced by interactions across institutional levels. Its function is instead to prevent diagnostic errors in accountability, particularly the attribution of adverse outcomes to institutions that lack the authority or capacity required to address their underlying causes.

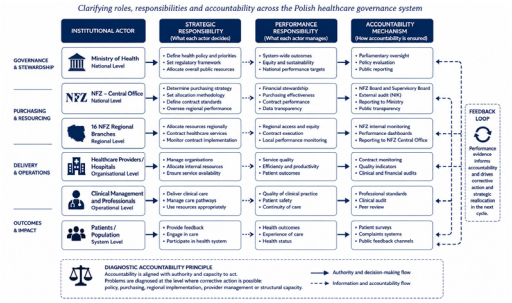


Figure 4. NFZ institutional accountability architecture

4.6 Strategic Feedback and Adaptive Governance

The final component converts NFZ-SGF from a static performance framework into an adaptive governance architecture. Performance assessment becomes strategically relevant when evidence from one purchasing period contributes to diagnosis and subsequent decisions.

The feedback sequence is:

Measure → Diagnose → Assign Responsibility → Select Corrective Action → Reassess

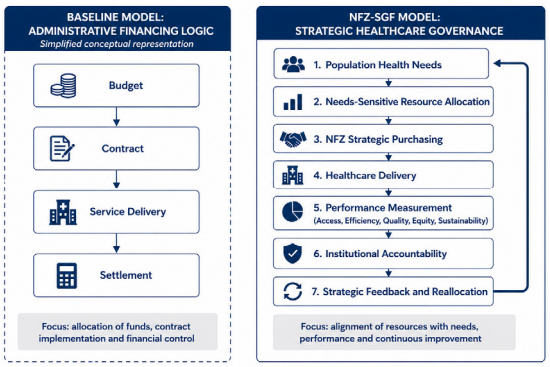


Figure 5. Strategic feedback and reallocation architecture

The feedback loop may operate at different institutional levels. Provider-level inefficiency may require operational intervention; regional access problems may require changes in purchasing or provider capacity; persistent workforce constraints may require national policy intervention. The relevant corrective mechanism therefore depends on diagnosis rather than on the performance indicator alone.

NFZ-SGF consequently distinguishes adaptive governance from automatic adjustment. Performance evidence informs decision-making but does not mechanically determine resource transfers, contractual sanctions, or organisational intervention.

The feedback loop is structured decision support, not an automated control rule. Institutional authority, evidence quality, contextual interpretation, and stated policy priorities determine the response. A single adverse indicator should not automatically trigger funding withdrawal or provider sanction without diagnosis and corroboration, since such triggers can amplify supply-dependent measures and invite gaming.

4.7 Integrated Results

The combined results produce a single strategic governance architecture in which population needs inform allocation; allocation establishes purchasing capacity; purchasing shapes healthcare delivery; delivery generates multidimensional performance evidence; diagnostic accountability identifies the appropriate level of corrective responsibility; and feedback informs subsequent allocation and purchasing decisions.

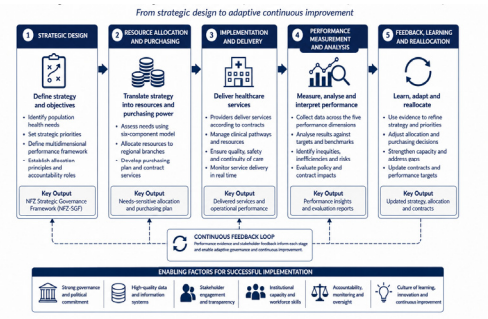


Figure 6. Integrated NFZ performance and governance cycle

The framework can therefore be summarised as:

Needs → Allocation → Purchasing → Delivery → Performance → Diagnosis → Accountability → Feedback → Reallocation

Its contribution is not the creation of additional administrative layers, but the integration of functions already central to healthcare governance into an explicit decision cycle.

NFZ-SGF therefore generates three principal propositions for subsequent empirical testing:

Operational test plan. A prospective regional panel would identify branch and calendar year, record NFZ spending and contracted values per resident by care category, age structure and morbidity proxies, workforce per 10,000 residents, care availability, utilisation, waiting times, and an explicitly dated corrective decision. Data must be aligned to the same territorial attribution (resident versus provider location), care category, population denominator, and accounting period. Missing or non-comparable series would be reported, not imputed silently. Sixteen branches in one year yield only 16 observations and do not support a six-covariate causal allocation model.

P1. Resource-allocation assessment that distinguishes population need, healthcare capacity, and observed utilisation should provide more diagnostically useful information than activity-based interpretation alone.

P1 test: compare the predictive and classification performance of population-only and need-plus-capacity specifications for held-out regional waiting-time or unmet-need measures, using prespecified indicators and leave-one-region-out checks. Report changes in out-of-sample error and regional priority ranks with uncertainty, without interpreting prediction as causation. A null result is no improvement beyond the population baseline, or unstable rankings under plausible indicator choices.

P2. Multidimensional performance assessment should provide stronger strategic decision support when linked to identifiable purchasing and institutional mechanisms rather than treated primarily as retrospective reporting.

P2 test: code whether a dated purchasing decision states its need, provider-capacity, and performance rationale and whether a later review revisits the same objective. Compare the completeness and traceability of decisions with and without an explicit feedback record, using a prespecified coding guide and independent double coding where possible. A null result is no difference in traceability or no subsequent decision response. Observational differences cannot establish that the framework caused better care.

P3. Corrective action should be more institutionally coherent when accountability is assigned according to authority and practical capacity to influence the diagnosed performance mechanism.

P3 test: present blinded, standardised regional waiting-time vignettes containing a signal, alternative mechanisms, and an authority map to independent NFZ and provider experts. Compare agreement and corrective-action feasibility under indicator-only versus mechanism-and-authority attribution, with randomised vignette order and predefined ratings. A null result is unchanged agreement or feasibility. This would test decision coherence, not patient outcomes.

Published regional evidence offers a limited empirical illustration, not original validation: an accessibility index based on health resources did not show a simple linear relationship with regional socioeconomic development or urbanisation (Zienkiewicz et al., 2018), while a later coordinated-care index combined facility availability with household perceptions and financial burden (Piekut & Pacian, 2026). Thus a regional access signal can change with the chosen denominator and domain. The studies use different years, services, and measures, so their figures are not pooled or treated as estimates of NFZ-SGF effects.

Original descriptive extraction, 2024. Table 5 joins the NFZ 2024 plan-execution report Table 6 (Narodowy Fundusz Zdrowia, 2025b) to year-end insured counts (activity report Table III.5), midyear residents (Table IV.22), and reported hospital-network PSZ services (Table II.1) (Narodowy Fundusz Zdrowia, 2025a). The 16 branch costs sum to PLN 132,260,404.85 thousand, matching the published branch total; a further PLN 48,091,194.66 thousand was executed centrally and is excluded. The 16 insured counts sum to 34,212,349; PSZ service counts sum to 58,350,938, also matching the source. Division of annual branch-executed costs by the end-year insured stock yields PLN 3,531-4,224 per insured, with a pooled branch ratio of PLN 3,866 and an unweighted branch median of PLN 3,869. Lubelski ranks highest and Wielkopolski lowest on that accounting ratio. PSZ reported service counts range from 1,257 to 2,310 per 1,000 end-year insured across branches (Wielkopolski and Podlaski respectively). Replacing insured counts with midyear residents gives PLN 3,236-3,807 per resident; these are sensitivity denominators, not equivalent eligible populations. PSZ counts concern only selected hospital-network services and are partly supply- and coding-dependent; their category is narrower than aggregate branch costs. The two branch ratios are juxtaposed, not used to estimate expenditure per service, unmet need, or causal effects.

Table 5. Actual 2024 NFZ branch health-service costs and population denominators across 16 branches (Narodowy Fundusz Zdrowia, 2025a; Narodowy Fundusz Zdrowia, 2025b)

NFZ branch	Actual cost (PLN m)	Insured (31 Dec)	PLN / insured	PSZ services / 1,000 insured
Dolnośląski	9,940.4	2,600,636	3,822	1,375
Kujawsko-Pomorski	6,910.2	1,762,066	3,922	1,959
Lubelski	7,626.8	1,805,369	4,224	1,998
Lubuski	3,212.5	869,892	3,693	1,458
Łódzki	8,828.8	2,211,578	3,992	1,785
Małopolski	11,956.4	3,132,596	3,817	1,677
Mazowiecki	19,734.3	5,258,372	3,753	1,848
Opolski	3,105.2	799,299	3,885	1,511
Podkarpacki	7,274.5	1,819,215	3,999	1,743
Podlaski	4,018.0	1,012,631	3,968	2,310
Pomorski	8,062.5	2,126,420	3,792	1,690
Śląski	16,122.5	3,940,175	4,092	1,649
Świętokrzyski	4,105.8	1,037,024	3,959	1,835
Warmińsko-Mazurski	4,380.1	1,157,161	3,785	1,799
Wielkopolski	11,496.2	3,255,719	3,531	1,257
Zachodniopomorski	5,486.3	1,424,196	3,852	1,857

Sources and denominators: NFZ 2024 financial-plan execution report Table 6 (Narodowy Fundusz Zdrowia, 2025b) gives actual branch health-service costs in thousands of PLN, excluding centrally booked costs. NFZ activity report Table III.5 (Narodowy Fundusz Zdrowia, 2025a) gives year-end CWU insured counts; Table IV.22 gives midyear residents for the sensitivity ratio; Table II.1 gives the number of services reported under the selected hospital-network PSZ system, not unique patients or all publicly funded services. PSZ services / 1,000 insured equals annual PSZ counts divided by end-year insured stock times 1,000. This service count is not aligned to aggregate spending by category and depends on provider supply and reporting; no cost per PSZ service or need-adjusted funding ratio is calculated. The emergency-team rate was excluded from this table because emergency-care costs are booked centrally, outside the branch expenditure numerator (Narodowy Fundusz Zdrowia, 2025a). Migration and residence-versus-accounting attribution also remain unresolved.

Institutional baseline. The ministerial allocation regulation already stratifies insured persons by single year of age and sex and derives relative cost factors for groups of services (Minister Zdrowia, 2009). Accordingly, an age-sensitive proposal cannot be presented as a new principle absent from NFZ allocation. Table 5 describes executed accounting costs, not the statutory allocation formula or the effect of its age-sex factors; testing additional need measures would require the inputs and resulting planned allocations for the same planning year, followed separately by actual execution.

Table 6. Measurement status of selected allocation-related dimensions in the 2024 branch comparison.

Dimension	2024 observation	Inference boundary
Population	CWU insured at year-end; midyear residents (Narodowy Fundusz Zdrowia, 2025a)	Distinct populations and observation dates; only descriptive normalization.
Age structure	Regional resident-age data identified; no branch insured-age crosswalk	Resident age profile cannot risk-adjust spending booked to an NFZ branch.
Morbidity	No harmonized 16-branch need measure extracted	Diagnoses or service counts would depend on access and coding.
Geography	Region and midyear resident counts (Narodowy Fundusz Zdrowia, 2025a)	No harmonized within-region remoteness or patient-flow measure.
Workforce	Regional workforce statistics identified; no harmonized linked series	Staff workplace and branch spending do not share a verified catchment.
Utilisation	PSZ reported services, Table II.1 (Narodowy Fundusz Zdrowia, 2025a)	Narrow service subset; supply-dependent and not category-matched to total costs.

These propositions are testable implications of the conceptual framework, not empirically established causal effects.

5. Discussion and Policy Implications

5.1 From Healthcare Financing to Strategic Purchasing

The principal implication of NFZ-SGF is that the strategic role of a public healthcare purchaser depends not only on the amount of resources available, but on the institutional capacity to connect population need, resource allocation, purchasing decisions, healthcare delivery, performance evidence, and subsequent corrective action. This interpretation is consistent with strategic-purchasing literature, which emphasises the deliberate use of information to determine what services should be purchased, from whom, and under which contractual and payment arrangements (Mathauer et al., 2017; World Health Organization, 2019; WHO Regional Office for Europe, 2023; Figueras et al., 2005; Mathauer & Dkhimi, 2019; Hawkins, 2017).

For Poland, this does not imply replacing existing NFZ financing, contracting, monitoring, or regional purchasing functions. The NFZ already performs substantial purchasing and administrative functions through its central administration and regional branches (Sowada et al., 2019; Sowada et al., 2024; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a). NFZ-SGF instead proposes a more explicit feedback relationship among these functions.

The distinction is important. A purchaser may possess extensive financial and contractual information without systematically connecting that information to population need or multidimensional performance. Similarly, performance indicators may be collected without materially influencing subsequent purchasing decisions. Strategic purchasing therefore depends on the managerial use of information, not merely its availability.

NFZ-SGF extends this logic by positioning purchasing between needs-sensitive allocation and multidimensional performance assessment. Purchasing becomes the mechanism through which allocated resources are translated into service capacity, while performance evidence provides information for subsequent purchasing cycles.

This interpretation also cautions against reducing strategic purchasing to pay-for-performance. Evidence on provider incentives demonstrates that payment mechanisms can generate heterogeneous and sometimes unintended responses (Eijkenaar et al., 2013; Eijkenaar, 2012; Barasa et al., 2021; Kachapila et al., 2023). The framework therefore supports differentiated purchasing arrangements rather than a single performance-payment formula.

5.2 Performance Governance and Needs-Sensitive Resource Allocation

A second implication concerns the relationship between resource allocation and performance. Traditional expenditure or utilisation measures are informative but insufficient when interpreted independently of population need and healthcare capacity. Resource governance requires a distinction among need, capacity, utilisation, accessibility pressure, and performance.

This distinction is particularly relevant to regional comparisons. Higher expenditure in one region does not necessarily indicate inefficiency, just as lower utilisation does not necessarily indicate lower need. Demographic structure, morbidity, socioeconomic conditions, workforce availability, geographical accessibility, and provider capacity can influence both expenditure and observed activity (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Smith et al., 2001; Smith, 2008; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020).

The conceptual allocation function proposed in NFZ-SGF:

$$RA(r) = f[P(r), A(r), M(r), D(r), W(r), U(r)]$$

should therefore be interpreted as an information architecture rather than a funding formula. Its contribution lies in specifying which categories of information should be considered before regional allocation differences are interpreted or modified.

This has an important policy implication. Needs-sensitive allocation should not necessarily produce equal funding or equal service utilisation across regions. Rather, it should make differences more explainable in relation to observable healthcare needs and constraints.

The same principle applies to performance. Access, efficiency, quality, equity, and sustainability may move in different directions. A policy improving one domain may impose costs on another. Consequently, NFZ performance governance should support multidimensional assessment rather than optimisation around a single target (Papanicolas et al., 2022). In European banking recruitment, AI adoption was associated with process efficiency gains alongside concerns about candidate trust, illustrating an efficiency–trust trade-off in a different organisational setting rather than providing evidence about NFZ performance (Prestini, 2026a).

NFZ-SGF thus reframes performance measurement as a diagnostic process: Indicator → Context → Mechanism → Institutional Interpretation → Decision rather than: Indicator → Automatic Reward/Penalty.

This distinction is central to preventing performance management from becoming mechanical target management.

5.3 Diagnostic Accountability as a Governance Mechanism

The concept of diagnostic accountability constitutes the principal theoretical extension of the accountability component of NFZ-SGF.

Traditional accountability frameworks emphasise answerability, transparency, responsibility, and consequences (Brinkerhoff, 2004; Brinkerhoff et al., 2017; Vian, 2020). These principles remain essential, but complex healthcare systems create an additional problem: poor performance does not necessarily identify the institution capable of correcting it.

A regional waiting-time problem illustrates this difficulty. Excessive waiting may reflect inadequate purchasing volumes, provider inefficiency, workforce shortages, referral practices, insufficient infrastructure, geographical constraints, or national regulatory and workforce policy. Assigning responsibility solely on the basis of the observed indicator risks confusing performance location with causal control.

Diagnostic accountability therefore adds an intermediate analytical step:

Performance Signal → Diagnosis → Corrective Authority → Accountability → Intervention

Corrective responsibility should be assigned to the institutional level possessing both authority and practical capacity to influence the identified mechanism. Depending on the diagnosis, this may involve the Ministry of Health, NFZ central administration, an NFZ regional branch, provider management, or clinical and organisational actors.

This approach has two implications. First, accountability becomes more actionable because responsibility is linked to corrective capacity. Second, it reduces the risk of institutional blame being assigned to actors unable to address the underlying problem.

Diagnostic accountability should nevertheless not be interpreted as requiring identification of a single responsible actor. Healthcare-system performance frequently results from interactions among institutions. The framework therefore

accommodates shared and sequential responsibility, provided that the contribution and corrective capacity of each institutional level can be specified.

This concept provides a testable extension to existing healthcare-accountability literature: future research can examine whether diagnostic attribution produces more coherent corrective decisions than accountability systems based primarily on indicator ownership or administrative hierarchy.

Existing accountability frameworks principally clarify who must answer, report, justify or face consequences for decisions and performance. Diagnostic accountability adds a prior attribution problem: before corrective responsibility is assigned, the observed performance signal must be linked to a plausible mechanism and to the institutional actor possessing both authority and practical corrective capacity.

5.4 Institutional and Policy Implications

NFZ-SGF implies differentiated responsibilities across the principal levels of Polish healthcare governance.

For NFZ central administration, the framework supports a stronger integrative role connecting national purchasing principles, allocation methodology, performance architecture, and strategic feedback. Central governance could establish common analytical standards while avoiding the assumption that identical regional outcomes should be expected across heterogeneous populations and provider environments.

For NFZ regional branches, the framework emphasises the interpretation of regional need, provider capacity, accessibility, and performance when developing purchasing priorities. Regional branches occupy a particularly important position because they translate national financing and purchasing principles into contracts with local provider environments (Sowada et al., 2019; Sowada et al., 2024; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a).

For healthcare providers, NFZ-SGF strengthens the connection between purchasing objectives and measurable service performance. However, providers should be held accountable primarily for dimensions over which they possess meaningful operational control. Workforce availability, national financing rules, or structural geographical constraints may limit the extent to which provider-level intervention can alter observed outcomes. At provider level, a conceptual AI-enabled workforce governance model for Polish public hospitals addresses workforce management under regulatory constraints; its scenario projections do not establish empirical effects of NFZ purchasing (Prestini, 2026b).

For the Ministry of Health, the framework provides a mechanism for distinguishing problems potentially addressable through NFZ purchasing from those requiring national policy intervention. Persistent workforce shortages, regulatory barriers, structural provider distribution, or national capacity constraints cannot necessarily be corrected through purchasing decisions alone.

The framework consequently supports vertical differentiation of corrective responsibility: National Policy → NFZ Strategic Governance → Regional Purchasing → Provider Management → Healthcare Delivery rather than treating all performance problems as purchasing failures.

Implementation should therefore favour progressive validation rather than immediate system-wide adoption. A practical sequence would begin with retrospective testing using existing NFZ and regional data, followed by pilot application to selected purchasing areas or regions, assessment of indicator reliability and behavioural responses, refinement of allocation and accountability mechanisms, and only subsequently consideration of broader implementation.

Importantly, NFZ-SGF does not require the creation of an entirely new information infrastructure before testing can begin. NFZ, Statistics Poland, OECD, and other public sources already generate substantial information concerning financing, activity, population, healthcare resources, access, and system performance (OECD & European Observatory on Health Systems and Policies, 2025; OECD, 2025b; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a). The initial challenge is therefore partly one of integration and managerial use of existing evidence.

5.5 Transparency, Legitimacy, and Theoretical Contribution

Public resource allocation inevitably contains normative choices. Decisions concerning which indicators to use, how to measure healthcare need, which performance dimensions to prioritise, and how purchasing should respond to observed differences can generate distributional consequences. Transparency is therefore an essential complement to strategic purchasing and accountability (World Health Organization, 2019; Brinkerhoff, 2004; Brinkerhoff et al., 2017; Vian, 2020; Hawkins, 2017).

Under NFZ-SGF, transparency should apply not only to expenditure but also to the logic connecting evidence and decisions. Allocation criteria, performance domains, indicator definitions, purchasing objectives, accountability rules, and major corrective decisions should be sufficiently explicit to permit institutional scrutiny. In the narrower context of AI-supported recruitment, the AI Recruitment Governance Framework similarly links transparency, accountability, and human oversight within an organisational governance architecture (Prestini, 2026c).

This can strengthen legitimacy in two ways. First, stakeholders can better understand why resources or purchasing priorities differ across regions or services. Second, decision-makers can be evaluated against explicit principles rather than solely against outcomes that may be influenced by factors outside their control.

The theoretical contribution of NFZ-SGF lies in integrating four established bodies of literature (strategic purchasing, needs-sensitive resource allocation, multidimensional performance management, and accountability) into a continuous governance cycle centred on a national public purchaser.

The framework contributes three specific propositions.

First, resource allocation should be analytically linked to population need and system capacity before performance differences are interpreted.

Second, performance measurement generates greater strategic value when connected to subsequent purchasing and allocation decisions.

Third, accountability becomes more actionable when corrective responsibility is assigned according to institutional authority and practical capacity rather than performance indicators alone.

The resulting architecture can be represented as:

Need → Allocation → Purchasing → Delivery → Performance → Diagnosis → Accountability → Feedback → Reallocation

NFZ-SGF therefore reframes healthcare purchasing as an adaptive governance process rather than a sequence ending with contractual settlement or retrospective performance reporting.

6. Limitations and Future Research

6.1 Limitations

The NFZ Strategic Governance Framework (NFZ-SGF) should be interpreted within several methodological and institutional limitations. First, the study is conceptual-analytical rather than causal or experimental. NFZ-SGF identifies theoretically and managerially relevant relationships among population health needs, resource allocation, strategic purchasing, healthcare delivery, performance, and accountability, but does not establish that implementation of the framework would improve access, efficiency, quality, equity, or sustainability.

Second, the analysis relies exclusively on publicly available secondary evidence and does not use patient-level, claims-level, provider-level, or detailed regional NFZ microdata. The framework therefore cannot be interpreted as an empirical assessment or ranking of individual NFZ regional branches, healthcare providers, or hospitals.

Third, the proposed resource-allocation relationship, $RA(r) = f[P(r), A(r), M(r), D(r), W(r), U(r)]$, is a conceptual specification rather than an econometrically estimated funding formula. No coefficients or relative weights are assigned to its components. Operationalisation would require empirical estimation, explicit normative choices concerning equity and efficiency, sensitivity analysis, and evaluation of distributional consequences (Smith et al., 2001; Smith, 2008).

Fourth, the proposed performance indicators are illustrative rather than operationally validated. Indicators of waiting times, quality, workforce capacity, utilisation, or regional variation differ in availability, comparability, attribution, clinical relevance, and susceptibility to behavioural responses. Operational application would therefore require assessment of data quality, risk adjustment, indicator validity, and potential unintended incentives (Eijkenaar et al., 2013; Eijkenaar, 2012; Barasa et al., 2021; Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a).

Finally, healthcare performance results from interactions among national policy, NFZ purchasing, regional implementation, provider management, workforce availability, clinical practice, demographic conditions, and patient behaviour. Performance variation cannot therefore be attributed mechanically to NFZ decisions. This limitation provides an important rationale for diagnostic accountability, under which corrective responsibility is assigned according to institutional authority and practical capacity rather than the location of an adverse indicator.

The 16-branch comparison describes actual branch-booked spending and selected PSZ service counts relative to population stocks, not a six-dimension allocation calibration. Comparable branch-level age, morbidity, geography, and clinical-workforce measures have not been assembled or risk-adjusted. PSZ is only one subset of utilisation; its administrative service counts cannot establish clinical need, and the source cautions that service counts depend on reporting conventions (Narodowy Fundusz Zdrowia, 2025a). CWU counts are a year-end insured stock, not person-years or every person eligible for care. Branch expenditure does not uniquely identify where care was delivered or the residence of its patient; cross-branch migration and centrally booked costs are material (Narodowy Fundusz Zdrowia, 2025b). The centrally funded emergency capacity measure is excluded from Table 5 (Narodowy Fundusz Zdrowia, 2025a). With 16 cross-sectional units, introducing several correlated and endogenous covariates in a regression would yield unstable, uninterpretable coefficients. These limits prevent inference about fairness, causal mechanisms, or optimal allocation weights; the framework remains empirically unvalidated.

Across the same 16 branches, the unweighted Pearson correlation between branch-executed cost per end-year insured and PSZ services per 1,000 end-year insured is 0.583 (calculated from Table 5). This joint descriptive comparison uses matched branch labels and a common insured denominator, but PSZ is a subset of activity and the numerator of spending includes many other services. The association is ecological and may reflect supply, referral, patient flows, case mix or reporting; it does not establish clinical need, efficiency, equity or a spending effect. The emergency-team density in the supplementary file is a contextual geographic-capacity descriptor; centrally booked emergency expenditure makes it inappropriate to treat it as a matching expenditure category.

International strategic-purchasing and governance evidence should likewise be interpreted as analytical benchmarking rather than institutional prescription. Poland's financing arrangements, provider configuration, workforce constraints, regional structure, and political-administrative environment limit the direct transferability of governance mechanisms developed elsewhere (Mathauer et al., 2017; World Health Organization, 2019; WHO Regional Office for Europe, 2023; Figueras et al., 2005; Mathauer & Dkhimi, 2019; Hawkins, 2017).

Accordingly, NFZ-SGF should be interpreted as a conceptually derived and empirically testable strategic governance architecture, not as a validated NFZ allocation algorithm or demonstrated policy intervention.

6.2 Future Research and Empirical Validation

Future research should move from conceptual development toward progressive empirical validation.

A first priority is regional validation across the 16 NFZ branches. Longitudinal regional datasets combining expenditure, population structure, morbidity, workforce capacity, provider availability, utilisation, waiting times, and selected performance indicators could test whether resource allocation corresponds to measurable healthcare need and whether purchasing changes are associated with subsequent performance variation (Statistics Poland, 2025; Statistics Poland, 2023; OECD, 2025a; OECD, 2020; Narodowy Fundusz Zdrowia, n.d.-c; Narodowy Fundusz Zdrowia, n.d.-b; Narodowy Fundusz Zdrowia, n.d.-a).

The supplementary 16-row dataset archives executed branch expenditure (Narodowy Fundusz Zdrowia, 2025b), insured counts, resident denominators, PSZ service counts, and a separately labelled emergency-capacity descriptor (Narodowy Fundusz Zdrowia, 2025a), with source-table identifiers and reproducible calculations. A next-stage dataset requires age and morbidity of the insured population rather than only of all residents, residence-linked spending and utilisation, comparable geography and clinical-workforce measures, and multi-year observations. Centrally financed care and migration require explicit allocation rules. Actual spending, planned spending, and contract maxima must remain distinct. Before estimating allocation weights, analysts must document missingness and conduct denominator and definition sensitivity checks.

A second priority is empirical testing of the needs-sensitive allocation architecture. Alternative specifications could compare population-based, demographically adjusted, health-needs-adjusted, and integrated needs-and-capacity allocation models. Rather than searching immediately for a single optimal formula, sensitivity analysis should examine how alternative weights and policy priorities affect regional resource distribution and trade-offs among access, efficiency, equity, and sustainability.

Third, provider-level validation should examine whether variation in NFZ purchasing volumes, contractual arrangements, and resource availability is associated with subsequent changes in service activity, waiting times, workforce pressure, quality, financial performance, and accessibility. Such analysis would test a central proposition of NFZ-SGF: additional financial resources can generate healthcare value only where sufficient organisational and workforce capacity exists to translate purchasing into effective service delivery.

Fourth, institutional validation should examine the proposed accountability architecture through interviews or structured consultation with NFZ central and regional decision-makers, Ministry of Health officials, hospital managers, clinicians, and other relevant stakeholders. This would test whether diagnostic accountability corresponds to actual distributions of authority, information, and corrective capacity.

The resulting research pathway can be summarised as:

Conceptual Framework → Regional Validation → Provider-Level Validation → Institutional Validation → Allocation-Model Testing → Decision-Support Evaluation

This progressive approach would allow NFZ-SGF to evolve from a conceptual management framework into an empirically tested model of public healthcare governance while preserving explicit safeguards against premature causal or operational claims.

7. Conclusion

This study addressed the question of how Poland's National Health Fund can integrate performance measurement, institutional accountability, and resource allocation within a unified strategic management framework. In response, it developed the NFZ Strategic Governance Framework (NFZ-SGF), which conceptualises public healthcare governance as a continuous relationship among population health needs, needs-sensitive resource allocation, strategic purchasing, healthcare delivery, multidimensional performance assessment, diagnostic accountability, and strategic feedback.

The framework advances three principal contributions. First, it positions multidimensional performance management at the centre of NFZ strategic governance. Healthcare performance cannot be adequately interpreted through expenditure, activity, or contractual compliance alone. Access, efficiency, quality, equity, and sustainability provide complementary dimensions through which purchasing and healthcare-system performance can be assessed (Papanicolas et al., 2022; OECD, 2025a).

Second, NFZ-SGF introduces a needs-sensitive resource-allocation architecture that distinguishes population need from observed utilisation and existing healthcare capacity. Population size, demographic structure, morbidity, socioeconomic need, workforce and provider capacity, and utilisation or accessibility pressure provide distinct forms of information for resource governance. The proposed relationship, $RA(r) = f[P(r), A(r), M(r), D(r), W(r), U(r)]$, is not an operational funding formula, but an analytical structure for evaluating whether allocation decisions correspond to observable differences in healthcare need and system constraints.

Third, the study develops diagnostic accountability as a mechanism connecting performance evidence with corrective responsibility. In complex healthcare systems, the location of an adverse indicator does not necessarily identify the institution capable of correcting its underlying cause. Accountability should therefore follow diagnosis and be assigned to the institutional level possessing both the authority and practical capacity to influence the identified performance mechanism.

Together, these elements reposition performance information within a continuous strategic cycle:

Needs → Allocation → Purchasing → Delivery → Performance → Diagnosis → Accountability → Feedback → Reallocation

The managerial significance of this architecture lies in transforming performance measurement from predominantly retrospective reporting into potential decision support for subsequent purchasing and resource stewardship. NFZ-SGF does not require performance indicators to generate automatic financial adjustments. Instead, evidence should support diagnosis, institutional interpretation, and proportionate corrective action.

The framework also clarifies the differentiated roles of Poland's healthcare institutions. NFZ central administration can provide national purchasing, allocation, and performance-governance principles; regional branches can translate these principles into regionally informed purchasing decisions; providers can respond to operational performance problems within their control; and the Ministry of Health can address structural constraints requiring national policy intervention. This differentiation is essential because healthcare performance frequently reflects interactions among financing, purchasing, provider capacity, workforce availability, demographic conditions, and national policy rather than the decisions of a single institution.

NFZ-SGF remains a conceptual and empirically testable framework. The study does not demonstrate that its implementation would causally improve healthcare outcomes, establish optimal allocation weights, or provide an operational NFZ funding algorithm. Future research should therefore test the framework using longitudinal regional data, provider-level performance information, alternative resource-allocation specifications, and institutional validation involving NFZ, healthcare-provider, and policy stakeholders.

The broader implication is that strengthening public healthcare governance depends not only on increasing financial resources or expanding the availability of performance data. It also requires institutional mechanisms capable of connecting healthcare needs, resources, purchasing decisions, performance evidence, accountable decision-makers, and subsequent corrective action. NFZ-SGF provides a structured architecture through which these relationships can be examined and, following empirical validation, potentially strengthened within Poland's public healthcare system.

Abbreviations

EU — European Union

CWU — Centralny Wykaz Ubezpieczonych (Central Register of Insured Persons)

GUS — Statistics Poland (*Główny Urząd Statystyczny*)

NFZ — National Health Fund (*Narodowy Fundusz Zdrowia*)

NFZ-SGF — NFZ Strategic Governance Framework

OECD — Organisation for Economic Co-operation and Development

PSZ — system podstawowego szpitalnego zabezpieczenia świadczeń opieki zdrowotnej (basic hospital healthcare provision system)

RA — Resource Allocation

WHO — World Health Organization

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Author Contributions

Dawid Krystian Prestini: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Visualization, Writing – original draft, Writing – review & editing. The author takes responsibility for the final manuscript.

Consent for Publication

The author approves publication of the manuscript subject to incorporation of the agreed proof corrections.

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The author declares no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed Consent

Not applicable. This study used publicly available secondary sources and aggregate administrative data; no human participants were recruited.

Ethics Approval

Not applicable. This study used publicly available secondary sources and aggregate administrative data and did not involve human participants, identifiable personal information, or confidential patient records.

Data Availability Statement

The study uses publicly available NFZ reports and other institutional sources identified in the reference list. The extracted 2024 dataset for the 16 NFZ regional branches and the accompanying source-screening audit have been submitted to the journal as supplementary materials. The dataset reports aggregate administrative data and contains no individual-level or identifiable personal information.

Use of Artificial Intelligence

Canva and ChatGPT were used to assist in creating the graphical elements of the manuscript, which were reviewed and approved by the author. ChatGPT was also used during proof review to assist in checking references and drafting proposed editorial corrections and citation insertions. The author is responsible for reviewing and verifying all proposed changes before submission and takes full responsibility for the final content.

Supplementary Materials

The supplementary materials submitted with the revised manuscript comprise (1) NFZ_2024_16_branch_descriptive_data.csv, containing the 16-branch dataset, and (2) IJBM_NFZ_source_screening_audit.docx, documenting the targeted official-source search and verification dated 25 September 2026.

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