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How Can National Health Accounts Be Transformed into a Data-Driven Strategic Management Tool

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Abstract

Since the 1970s, OECD countries have struggled to control health care expenditure, which has grown much faster than GDP. One of the responses was the development of National Health Accounts (NHA). Today, NHA provide an accounting, classification, and monitoring framework for health expenditure. Developed by the OECD and recommended by WHO, they are mandatory in all European Union countries and are used by many WHO member states under the international SHA 2011 standard. However, the introduction of NHA has not curbed health care spending in OECD countries, which continues to outpace GDP growth. The authors argue that a key limitation of NHA is the lack of end-to-end integration with financial and managerial accounting systems, which reduces the accuracy, timeliness, and practical value of NHA data and makes them poorly suited for management purposes. As a result, NHA are currently used primarily for retrospective monitoring and sector-level analysis, macroeconomic research, and cross-country comparisons. The authors propose transforming NHA from a method of statistical observation into a data-driven management tool by combining the SHA 2011 standard with end-to-end financial management of the health sector based on line-item budgeting—an approach that ensured the high efficiency of the Soviet health system.

Keywords: national health accounts, SHA 2011, end-to-end integration, accounting, line-item budgeting, data-driven management

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如何把国民健康账户转变基于数据的站略管理方法

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摘要

自20世纪70年代以来，经济合作和发展组织（经合组织）国家一直无法有效控制医疗保健成本，而医疗保健成本的增长速度明显快于国内总产值（GDP）。解决方案之一是为经合组织国家制定国民健康账（NHA）。它今天是一个使用国际标准SHA 2011的会计，分类和跟踪医疗保健成本的系统。这项经合组织的发展是世卫组织推荐的，对所有欧盟国家都是强制性的，并被大量世卫组织成员国使用。然而，NHA的引入并没有帮助经合组织国家控制医疗保健成本，而医疗保健成本仍然比今天的GDP增长得快得多。本文的作者认为NHA的主要缺点是缺乏与会计和管理的End-to-End通积分。这降低NHA数据的准确性及时性和价值，使其不适合管理。因此，今天NHA主要用于行业数据的回顾性监测和分析，宏观经济研究和跨国比较。作者提出将NHA从统计观察方法转变为基于数据的管理工具。该方法基于SHA2011标准与按细账预算为医疗保健提供融资的End-to-End通管理的综合。相同的方法确保了苏联医疗保健的高效率。

关键词： SHA 2011、End-to-End通过程、会计、细账预算。

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Introduction

The establishment of universal access to health care services in developed OECD countries took place under exceptionally favorable economic conditions during the so-called Golden Age of Capitalism, spanning from the end of World War II to the mid-1970s. During this period, average annual GDP growth in these countries reached 5–8%, while health care expenditure remained relatively low for an extended time, not exceeding 2–3% of GDP [Political economy and innovations.., 2024]. However, between the 1970s and the 1990s, the global economy entered a prolonged period of recession marked by pronounced stagflation, characterized by declining production, rising inflation, and increasing unemployment. GDP growth rates in Western countries declined sharply. At the same time, medical specialties expanded rapidly and a technological revolution in medicine took place, life expectancy began to increase rapidly, and an epidemic of chronic non-communicable diseases emerged. As a result, health care expenditure in OECD countries started to grow rapidly, significantly outpacing GDP growth. Notably, the Soviet Union demonstrated effective control over health care spending and its alignment with the level of economic output (Table 1).

The persistent difficulty OECD countries have faced in controlling health care spending – and in keeping it aligned with overall economic output – was a major impetus for creating centralized systems to track health sector financial resources in the form of National Health Accounts (NHA). NHA are a standardized organizational framework, integrated with the System of National Accounts (SNA), for the systematic accounting, classification, and analysis of health care expenditure. NHA first developed within OECD countries, shaped by national health-system specificities. In 2000, the first international standard, SHA 1.0, was adopted [A system of health.., 2000], and in 2011 it was replaced by a revised and expanded version, SHA 2011 [A system of health.., 2017].

Under SHA 2011, NHA capture all monetary flows related to the consumption of health care goods and services within a country using a single, harmonized classification system. NHA data answer three core questions: what health care goods and services are financed, who provides them, and through which financing schemes and sources they are financed (health care functions HC, providers HP, and financing schemes HF). SHA 2011 specifies detailed classifications by expenditure (e.g., inpatient care, outpatient care, pharmaceuticals, long-term care), by provider (hospitals, outpatient clinics, pharmacies, etc.), and by financing source or scheme (government budgets, compulsory health insurance, voluntary insurance, and out-of-pocket payments).

Table 1
Health care expenditure in developed OECD countries (% of GDP) and the USSR (% of gross social product)

Country	1970	1980	1990
United States	6.9	8.7	11.9
United Kingdom	4.5	5.6	6.0
Canada	7.0	7.0	9.0
Australia	4.6	7.0	7.8
Austria	5.1	7.4	7.0
Belgium	4.0	6.4	7.4
Denmark	8.0	9.1	8.5
Finland	5.6	6.4	7.8
France	5.4	7.1	8.6
Germany	6.2	8.7	8.5
Greece	6.1	6.6	7.4
Ireland	5.1	8.4	6.1
Japan	4.5	6.5	5.9
Netherlands	6.9	7.5	8.0
New Zealand	5.1	5.9	6.9
Norway	4.4	7.0	7.7
Portugal	2.6	5.6	6.2
Spain	3.6	5.4	6.7
Sweden	6.9	9.1	8.4
Switzerland	5.5	7.4	8.3
USSR	1.8	1.8	1.7

Source: Authors' calculations based on: National economy of the USSR in 1980: A statistical yearbook. Moscow, 1981; National economy of the USSR in 1990: A statistical yearbook. Moscow, 1991; [Colombo, Morgan, 2006].

Based on the SHA 2011 NHA tables, it is possible to derive indicators of the level and composition of health care expenditure, track its dynamics and share of GDP, assess the relative contributions of public and private financing, and carry out cross-country comparisons. Because SHA 2011 is aligned with the SNA, health care aggregates can be directly linked to key macroeconomic indicators such as GDP and government expenditure. Under SHA 2011, the primary purpose of NHA is to support regular, time-consistent, and internationally comparable monitoring and analysis of health care financing and to inform health policy development[1, 2].

Today, regular compilation of NHA under the SHA 2011 standard is recommended and supported by the World Health Organization. According to information published on the official WHO website[3], around 100 WHO member states – more than half of all countries worldwide – periodically compile national health accounts using the SHA 2011 methodology.

In the European Union, annual compilation and publication of national health accounts in accordance with SHA 2011 has been mandatory since 2013 under Regulation (EC) No. 1338/2008 and Regulation (EC) No. 2015/359. Regulation (EC) No. 1338/2008 of the European Parliament and of the Council of 16 December 2008 on Community statistics on public health provides a unified legal framework for the collection, production, transmission, and evaluation of European health statistics, including statistics on health care financing and expenditure.

EU member states are required to submit detailed annual data on health care expenditure and its financing to Eurostat in accordance with the SHA 2011 methodology. Regulation (EU) 2021/1901 of 29 October 2021, which approves the technical specifications for the transmission of SHA data, defines the specific rules and data formats for SHA 2011 reporting, including breakdowns by functions, providers, and financing schemes, thereby making compliance with the system mandatory throughout the EU. Failure to comply with these regulations may result in sanctions. The European Commission is entitled to initiate financial penalties against a member state in cases of systematic non-compliance or falsification of mandatory statistical data[4]. Non-compliant countries may face restrictions on access to EU funding, suspension of financial support or grants, limitations on participation in international comparative projects, restricted access to shared statistical and analytical platforms, and constraints affecting national insurance systems and intergovernmental planning. Eurostat may formally designate a country as non-compliant with established standards, leading to public disclosure and the imposition of corrective measures subject to strict timelines and ongoing monitoring.

However, the very fact that NHA compilation requires strong administrative enforcement even within the European Union indicates that the development and operation of NHA systems involve substantial challenges, and that the benefits of NHA are not as unequivocal as they are often perceived by European bureaucratic institutions.

For example, the 2025 OECD report on best practices in NHA implementation [Best practice.., 2025] shows that a number of OECD countries limit themselves to the minimum basic set of tables recommended by the SHA 2011 standard and fail to ensure the regular availability of complete datasets for all years covered by the joint OECD – Eurostat – WHO questionnaire.

Moreover, despite the risk of penalties and sanctions, some OECD countries (e.g., New Zealand) periodically fail to submit NHA data in the SHA 2011 format altogether. Unsurprisingly, the situation with NHA implementation in non-EU countries is even less favorable. As of 2017, only around 40 such countries compiled NHA on a routine basis, that is, with relative regularity [Rathe et al., 2018]. At the same time, in most post-Soviet countries, attempts to establish NHA systems either remained at the pilot stage or were never initiated (Table 2).

Thus, significant challenges persist in NHA implementation even among OECD countries. Yet the introduction of NHA has not enabled these countries to control health care expenditure which, according to WHO data for 2000–2017, grew at approximately twice the rate of economic growth in OECD countries [Global spending.., 2019].

Overall, these observations point to a systemic limitation in the current national health accounts methodology. NHA implementation remains difficult, while the benefits of adoption clearly fall short of initial expectations.

The authors hypothesize that the main methodological limitation of national health accounts is the lack of end-to-end integration with financial and managerial accounting systems. This disconnect deprives NHA data of practical managerial value, confining their use largely to retrospective monitoring, sector-level analysis, macroeconomic research, and cross-country comparisons. As a result, the financial resources and administrative effort devoted to developing and maintaining NHA are, at best, disproportionate to the returns these systems generate. This helps explain the limited interest in NHA even among OECD countries, and even more so among low- and middle-income countries.

[1] http://data.europa.eu/eli/reg/2008/1338/oj.
[2] http://data.europa.eu/eli/reg/2015/359/oj.
[3] https://apps.who.int/nha/database.
[4] http://data.europa.eu/eli/dec_del/2012/678/oj.

Table 2
Establishment of NHA systems in former Soviet republics (excluding the Baltic States and Ukraine)

Country	Year of most recent publication (public report or health accounts data)	Health accounts standard
Belarus	2024	National standard, not aligned with SHA 2011
Armenia	2023	SHA 2011
Kazakhstan	2018	SHA 2011
Kyrgyzstan	2009	Pilot project
Russia	2007	National standard, partially aligned with SHA 1.0.
Georgia	2004	SHA 1.0 (pilot project)
Moldova	2011	Prepared under SHA 1.0 as part of a pilot project; however, no evidence of publication or any related data could be found in open sources.
Uzbekistan	—	—
Azerbaijan	—	—
Turkmenistan	—	—

Source: Compiled by the authors based on: https://minzdrav.gov.by/ru/ministerstvo/sistema-schetov-zdravookhraneniya.php; https://nih.am/assets/pdf/atvk/b05a6b3ef948a86a63234817d55869df.pdf; https://doi.org/10.1787/9789264289604-en; http://hpac.kg/wp-content/uploads/2016/02/prp71_rus.pdf; https://www.researchgate.net/publication/237437542_national_health_accounts_for_georgia_2001-2003_national_health_accounts_for_georgia; [Starodubov et al., 2007; Turcanu et al., 2012].

1. Convergence of National Health Accounts and End-to-End Accounting as a Pathway for Institutional Development

To substantiate their hypothesis, the authors reviewed international methodological guidelines and reports on the establishment (institutionalization) and operation of National Health Accounts (NHA) [Berman, 1997; Guide to producing.., 2003; Maeda et al., 2012; A system of health.., 2017; Framework for assessing.., 2023; Best practice.., 2025; Mon et al., 2025].

These sources consistently identify the lack of end-to-end integration between NHA and financial and managerial accounting as a major systemic limitation of NHA and as a key source of the difficulties encountered in their development and operation.

Author of [Berman, 1997] argues that the key question is whether health accounts data can be derived consistently from providers' financial statements. In most developing countries, such a direct correspondence does not exist; as a result, health accounts require substantial estimation, reconciliation, and reclassification.

The Producers Guide [Guide to producing.., 2003] notes that most countries have complex health financing arrangements with multiple funding sources and agents. Tracking these flows and producing comparable accounts is challenging, as the complexity and diversity of financing mechanisms pose a significant barrier to standardization and to the implementation of national health accounts. At the same time, providers' financial and managerial accounting systems are poorly aligned with NHA classifications, making data reconciliation and interpretation resource-intensive.

The SHA 2011 standard description [A system of health.., 2017] emphasizes that fragmentation of health financing schemes and the presence of numerous reporting agents substantially complicate mapping financial flows to SHA categories. In practice, there is seldom a one-to-

one mapping between providers' accounting records and SHA functional categories, which necessitates the use of bridge tables, aggregation procedures, and, in many cases, expert judgment.

The World Bank guide [Maeda et al., 2012] highlights that the diversity and complexity of financing mechanisms make data collection and consolidation for health accounts a major institutional challenge. The multiplicity of financial flows, sources, and implementing actors hampers both routine reporting and verification. In turn, weak alignment between health accounts and financial accounting systems reduces reliability and complicates quality assurance and audit.

A review of NHA implementation in OECD countries [Best practice.., 2025] indicates that countries with highly fragmented or decentralized financing systems, multiple insurers, or a substantial private sector face significant obstacles in producing robust and comprehensive health accounts. A persistent challenge is the lack of direct correspondence between managerial accounting categories and SHA reporting requirements. Consequently, many countries often have to rely on manual adjustments and reconciliation. In most cases, SHA 2011 relies on the aggregation of heterogeneous sources (budgets, insurance funds, surveys, provider reports) rather than on direct data extraction from an integrated financial and managerial accounting system. This can create discrepancies between national accounts indicators and actual financial records at the level of institutions and funding authorities.

According to the Framework for assessing health accounts maturity [Framework for assessing.., 2023], diversified financing flows and multiple reporting agents create a major barrier, often leading to incomplete data and limited comparability. The framework further emphasizes that maturity requires full integration with providers' routine accounting and managerial reporting; however, progress has been slow in most countries.

Although the establishment of NHA in non-OECD countries is more recent, available evidence indicates that the lack of integration between NHA and financial and managerial accounting is equally consequential in these settings. Reports on NHA implementation in Eastern Mediterranean countries show that most reports are published with delays of several years; only three countries in the region have managed to establish annual reporting. This outcome is directly linked to difficulties in accessing data, collecting information from multiple fragmented sources, and manually reconciling it with budgetary and accounting records. As a result, many countries are unable to institutionalize regular NHA production because of difficulties in obtaining and processing primary financial data and the lack of a standardized interface between accounting systems and the SHA 2011 framework. Evidence from pilot NHA projects in Egypt and Palestine indicates that source data from national accounting systems do not align with SHA 2011 requirements in structure. The South Africa report emphasizes that NHA construction relies on on compiling data from numerous fragmented sources (national and provincial budgets, insurance schemes, household surveys, and hospital administrative records), while highlighting mismatches between classifications and the need for recoding and reconciliation with SHA 2011 classifications. This indicates the absence of end-to-end linkage with providers' accounting systems [Best practice.., 2025].

Thus, methodological guidelines and institutionalization reviews indicate that even in most OECD countries, alignment between SHA and national accounting systems remains incomplete. Data are typically compiled as samples or aggregates drawn from multiple systems (statistics, budgets, fund accounts) rather than generated through modules built into providers' accounting systems. This systemic limitation is even more pronounced in low- and middle-income countries.

Analysis of OECD countries' experience with NHA implementation – both the limited practical fulfillment of the full set of SHA 2011 requirements and the questionable effectiveness of NHA as a tool for managing health care financing – suggests that, at present, SHA 2011-based NHA fall well short of a mature system in which strict procedures reliably ensure the intended outcomes. At this stage, NHA under SHA 2011 resemble a roadmap, strategic plan, or development tool for centralized accounting and analysis of health care financial resources – one that specifies what should be done and how, but without guaranteeing a concrete outcome.

To date, OECD countries have not achieved end-to-end integration of NHA with financial and managerial accounting. Instead, they have addressed the complexity of health financing systems in line with Ashby's cybernetic principle: NHA systems are designed to be as complex as the financing models they reflect. Separate data collection and verification channels are established and maintained for each function, provider group, and financing scheme. This results in NHA functioning as an additional, highly complex and resource-intensive structure that collects data primarily through requests rather than through automated extraction from accounting and managerial systems. Such an approach reduces data quality, necessitates extensive verification, and limits its usefulness for managerial decision-making. Consequently, the more complex the health financing system, the more complex and costly the NHA system becomes – and the lower the quality and practical value of the resulting data. This gives rise to a range of inherent limitations, shortcomings, and risks associated with NHA.

2. The Soviet Experience as a Potential Policy Model

As shown in Table 1, the Soviet Union demonstrated effective control over health care expenditure and its alignment with overall economic output. This reflected a fundamentally different approach to centralized accounting of health sector financial resources. Despite operating as a low-income country under conditions of severe resource scarcity, the USSR established the world's first system of universal access to health care. Under these circumstances, centralized and highly detailed resource accounting became a core instrument for improving the efficiency of the health care system.

Resource scarcity pushed the architects of the Soviet health system toward a fundamentally different approach – reengineering through a radical redesign of the financing system. On the one hand, this meant simplifying and streamlining the system by eliminating intermediaries and removing redundant or duplicative processes, primarily by integrating the payer (a public administration authority) with providers that were both administratively subordinate and financially accountable to it (state medical organizations). On the other hand, it meant turning line-item budgeting (LIB) into a universal end-to-end method for managing the entire health financing cycle, allowing financial flows to be tracked from the USSR State Planning Committee down to rural feldsher – midwife stations. This approach covered resource norm-setting and planning, organization of resource use, incentives for cost efficiency, accounting of government health expenditures and providers' costs, and control over the targeted use of funds [Popov, 1976].

There are grounds to suggest that this Soviet innovation offered several advantages over the NHA systems adopted in OECD countries. Despite its low-income status, the Soviet Union established the world's first system of universal health coverage (UHC), with health expenditure levels far below those of OECD countries while delivering comparable access to medical care. Unlike OECD countries, the USSR maintained effective control over health care expenditure and kept it aligned with overall economic output.

At the same time, the Soviet system had shortcomings that may also be seen as areas for further development. Because the USSR lagged behind in macroeconomic research and treated health care as a "non-productive" sector, its contribution to social production was not captured in intersectoral balance models. Unlike NHA, Soviet accounting data were designed primarily for day-to-day management and were insufficiently detailed for health policy purposes. In addition, the lack of compatibility with international standards constrained meaningful international comparisons and the exchange of best practices.

Accordingly, there is reason to assume that the main problems of Soviet health care – residual financing, imbalances in resource allocation, and pronounced regional and social inequalities in funding – stemmed not from intrinsic flaws of the Soviet model itself, but from weaknesses in health policy, including the absence of the statistical data required for informed decision-making. This calls into question the scientific basis of the 1990s reforms built around the narrative of the Semashko system's "low economic efficiency" and suggests that convergence between Soviet end-to-end accounting based on LIB and Western NHA frameworks may offer a promising direction.

Why does such convergence appear feasible?

First, in terms of objectives, the Soviet and Western approaches are complementary. In OECD countries, NHA data are not integrated with financial and managerial accounting. As a result, the development and operation of NHA rely on costly data collection and verification subsystems, while the resulting data remain poorly suited for managerial use. This helps explain why NHA have failed to support effective control of health care expenditure in OECD countries. At the same time, NHA are explicitly designed to link health care with the broader economy within the System of National Accounts, to support international comparisons, and to inform policy (strategic) decisions in health financing – an area in which OECD countries have achieved notable success, particularly in reducing imbalances and inequalities in health care financing.

By contrast, in the Soviet health system, the end-to-end LIB approach was fully integrated with financial and managerial accounting and was conceived primarily as an operational management tool rather than a policy instrument. This integration underpinned the USSR's strong performance in expenditure control and its ability to achieve universal access to care at minimal cost. However, in its Soviet form, LIB did not allow for assessment of health care's contribution to GDP, constrained international comparability, and provided decision-makers with a very limited set of indicators for policy (strategic) decision-making in health financing.

In terms of objectives, therefore, OECD NHA and the Soviet LIB approach complement each other, each addressing the key weaknesses and systemic limitations of the other.

Second, both approaches share a common methodological foundation rooted in cybernetics: the principle of decomposition – breaking a complex health expenditure system into simpler elements such as budget lines, accounting categories, or codes – and the use of cross-tabulation (matrix methods). This involves the classification, systematization, and organization of data

along integrated axes, facilitating data perception and analysis, and the identification of correlations between them.

At the same time, NHA under the SHA 2011 standard offer a clear advantage over the Soviet LIB format in terms of data classification and analytical capacity. Whereas the Soviet LIB relied on a relatively simple classification structure, SHA 2011 reflects the complexity of modern health care systems. Its extensive and continuously updated classification framework enables much deeper analytical granularity, advancing the cybernetic principle of requisite variety. This increased classification complexity has, in turn, necessitated the development of a more sophisticated analytical apparatus based on cross-tabulation.

Accordingly, while the Soviet LIB relied primarily on two-dimensional and weakly integrated cross-tables, SHA 2011-based NHA operate across multiple, systematically integrated data axes using a wide range of two-, three-, and multidimensional matrices. NHA are also adapted to market economies and multi-level health financing systems through the use of double-entry bookkeeping and accrual accounting. However, the NHA classification framework and its robust analytical toolkit can be used to define the classification of LIB budget lines and tables.

Third, there are no inherent obstacles to combining NHA with end-to-end management of the entire health financing cycle based on LIB, including its adoption as a universal and exclusive payment method for medical providers. Such an approach would address the principal systemic limitation of NHA – their lack of integration with financial and managerial accounting – and eliminate the need for a costly auxiliary bureaucratic structure dedicated to data collection and verification.

During the neoliberal reforms of the 1990s, LIB was widely stigmatized as an "inefficient" method of paying for medical care. The present study reviewed both international and Russian sources in search of objective evidence to substantiate this claim – beyond expert opinion or citation chains – and found none. In practice, LIB remains the conventional methodological foundation of sound financial planning, accounting, and cost control in both the public sector and business. Moreover, in its various forms, LIB is effectively indispensable for pricing complex services and projects characterized by high uncertainty and risk, including construction, infrastructure, shipbuilding, energy, and health care. World Bank experts acknowledge that LIB has long been and continues to be a widely used and effective method of cost control in health care, particularly in low-income countries [Langenbrunner et al., 2009]. In several countries, line-item budgeting remains the primary instrument for ensuring financial control, transparency, and the prevention of overspending in the health sector [Mon et al., 2025]. LIB also demonstrates resilience in primary health care, facilitating regulatory compliance, ensuring stable funding for basic services, and reducing managerial risks – especially in contexts of limited digitalization and weak institutional capacity [Pholpark et al., 2025].

At the same time, LIB has served as the foundation for a broad range of modern budgeting approaches designed to mitigate the shortcomings of classical line-item budgeting while preserving its advantages. These include activity-based budgeting, program- and performance-based budgeting, zero-based budgeting, rolling budgets, and process-oriented budgeting.

The pricing logic underlying LIB is well aligned with the specific characteristics of health care services – their complexity, probabilistic effectiveness, and substantial variability in demand, costs, and cost structures. Advances in information technology make it possible to achieve greater precision, flexibility, adaptability, and managerial control under LIB-based financing than under lump-sum payment models that consolidate all provider costs into a single tariff, such as fee-for-service, capitation, global budgets, diagnosis-related groups, and related mechanisms. LIB is also suitable for contracting both public and private (commercial) medical providers, thereby enhancing transparency in pricing and financial settlements. In business practice, the budget line reflecting a contractor's margin (profitability) is typically referred to as estimated profit or overheads and profit.

Accordingly, there are strong grounds to believe that convergence between two approaches to health sector financial accounting that emerged under very different historical conditions – the Soviet model and those adopted in OECD countries – can combine their respective strengths within a new approach while mitigating their inherent limitations. The task, therefore, is to design a new health financing system, at least for the public sector, that combines the end-to-end nature of hierarchically planned, implemented, and controlled line-item budgets – in their modern interpretations, including activity-based budgeting, program- and performance-based budgeting, results-oriented budgeting, zero-based budgeting, rolling budgets, and process-oriented budgeting – with organization based on classifications and aligned with the integrated data axes of SHA 2011.

In this way, NHA can be transformed from a tool of retrospective statistical observation into a data-driven instrument for managing health care financing.

Conclusions

1. Analysis of NHA implementation and practical use indicates that this methodology is in crisis, as reflected in low interest in NHA even among OECD countries.

2. The primary driver of this limited interest is the lack of end-to-end integration between NHA and financial and managerial accounting, which reduces the accuracy, timeliness, and practical value of NHA data and makes them poorly suited for management purposes.

3. A feasible and promising way to transform NHA from a passive tool of retrospective statistical observation into a data-driven management instrument is to synthesize (converge) them with the Soviet-developed approach to end-to-end health financing management based on a hierarchical system of line-item budgets.

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