



Exploring the risks of fragmentation in health care markets – An analysis of inpatient care in Georgia

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ABSTRACT

Private providers play an important role in health systems in low-and middle-income countries. In many such contexts, markets are characterized by a high number of relatively small private facilities. The potential risks from highly concentrated healthcare markets are well-researched, and feature in the “Theories of Harm” investigated by competition regulators. However, there is limited evidence on markets that exhibit substantial harms as a result of very low concentration. This paper explores the risks associated with such market fragmentation, drawing on the example of Georgia, which has a largely privatized provider network.

We used a mixed-method study design to analyze the inpatient market in Georgia. Market structure was described using administrative data on bed capacity and discharge numbers and geo-location data on travel time between facilities. The implications of the market structure were explored through in-depth interviews (n = 35) with policymakers, healthcare managers, and local experts and an anonymous online survey of similar groups (n = 97).

Georgia’s inpatient sector is characterized by a high number of small hospitals in terms of bed numbers and inpatient volumes, mitigated to a limited degree by the presence of provider networks. Travel time to the 3rd nearest competitor was extremely short, ranging from 3 to 5 min in big cities to 10 min in small towns and 33 min in remote locations. The fragmented nature of the market, together with inadequate regulatory and purchasing mechanisms, was argued to exacerbate challenges in the availability and competence of clinical staff, while the financial challenges caused by intense competition encouraged wasteful marketing, harmful cost-cutting measures, and demand inducement.

We present “Theories of Harm” from market fragmentation, and argue that an effective policy response requires market-shaping activities using regulatory, financing, and purchasing mechanisms to encourage appropriate levels of market consolidation and so enhance quality, efficiency, and effective governance.

1. Introduction

The private sector is playing an increasingly important role in providing healthcare in low-and middle-income countries (LMICs) (Mackintosh et al., 2016; Montagu and Chakraborty, 2021). As governments strive to achieve universal health coverage (UHC) they are exploring ways to engage the private sector effectively, and to enhance the efficiency and quality of service provision through public-private collaboration (World Health Organization, 2020).

Effective engagement of private providers requires a better understanding of an under-researched topic - how healthcare markets operate in LMIC settings. A key influence on this is the structure of the market, which can be described on a continuum ranging from very low concentration, with many suppliers with small market shares, to high concentration, where a few large firms account for most provision, or at the extreme, there is a sole supplier or monopoly. The potential risks from highly concentrated healthcare markets are well-described in the literature in terms of negative impacts on prices, efficiency, and quality (Ho

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and Hamilton, 2000; Propper, 2018; Schmid and Ulrich, 2013), and feature prominently in the “Theories of Harm” investigated by competition regulators (Ho and Hamilton, 2000; Schmid and Ulrich, 2013; U.S. Department of Justice and the Federal Trade Commission, 2023). However, there has been far less discussion about the risks from very low concentration.

In a concentrated market, it is argued that market power may lead to higher prices for consumers, while the limited number of competitors dampens incentives to improve efficiency (National Academy of Social Insurance, 2015). Incentives may also be lacking to improve quality due to limited choice for consumers or third-party purchasers (Propper, 2018). Greater competition with a higher number of providers is thus argued to have the potential to improve quality and contain costs. It is acknowledged that market failures could limit the potentially beneficial role of competition. The patient’s lack of technical knowledge, and the role of health providers in directing patient care, may leave patients vulnerable to low-quality treatment, excessive use of diagnostics, and over-prescription (Baier et al., 2019; Hanson et al., 2008). The role of patient choice in shaping market outcomes may be constrained by inadequate information and patients’ lack of willingness to engage in the process of choosing a provider (Dixon et al., 2010).

However, the specific harms that could arise when a market has very low concentration are not fully recognized or well-discussed in academic or policy fora, though they are beginning to be flagged as a source of concern, especially for inpatient care in privatized LMIC markets with weak health sector regulation (Cohen et al., 2017; Gautham et al., 2019; Kruk et al., 2016). For example, many or most providers may be operating below the minimal scale necessary for delivering efficient and quality care. This could result in higher prices due to a lack of scale economies, unnecessary duplication, and quality concerns associated with low patient volumes, particularly for inpatient services. Furthermore, there could be higher costs to the government and purchasers for regulating and contracting large numbers of providers (Lagomarsino et al., 2009). We propose the term “**fragmentation**” to describe a market that exhibits substantial such harms as a result of the high number of small providers.

Georgia offers an informative setting within which to explore these issues, given its highly privatized healthcare market, large number of healthcare providers, and the central role private providers play in providing services funded through pooled public funds (Richardson and Berdzuli, 2017; World Health Organization, 2023). Georgia is a former Soviet country located in the Caucasus, with a population of 3.68 million in 2022. Real Gross Domestic Product (GDP) grew by 4.9% on average in the ten years before the COVID-19 crisis (2010–2019), reaching a GDP per capita of \$5015 at the end of 2021 (Geostat, 2022). Following the collapse of the Soviet Union in 1991, the privatization of Georgia’s health sector was implemented in several waves from the mid-90s, with about 80% of all hospital beds and most primary care and outpatient specialists being transferred to private ownership by 2010. Only a handful of specialized hospitals (such as mental health, TB, and HIV) remain under public ownership (Owen, 2013). The decision to privatize was motivated by the obsolescence of the healthcare infrastructure inherited from the Soviet Union and the lack of public resources for necessary capital upgrades. Therefore it was decided to upgrade dilapidated infrastructure by attracting private capital (Shengelia et al., 2016).

Since 2013, the government has been striving to improve coverage and financial protection through a UHC program with a tightly defined package of tax-funded benefits, which covers 98% of the population (Goginashvili et al., 2021). Services included in the benefits are purchased from the private and public sectors by a public single-payer – the National Health Agency (NHA) – that manages pooled public funds (World Health Organization, 2023). Under the UHC program, facilities are allowed to set their prices, but the UHC program reimburses them with a fixed state tariff determined using the median of the lowest 20% of prices charged by the facilities (International Finance Corporation,

2018). If the facility’s price exceeds the reimbursement tariff for a given service the patient pays the difference out-of-pocket through what is known as balance billing. In addition, certain population groups are required to pay UHC program co-payments determined as a fixed share of the government-established tariff. Veterans and those below the poverty line are exempt from co-payments, but not from balance billing (Government of Georgia, 2013). Following the introduction of UHC, hospital bed numbers grew by 41% from 2012 to 2018 (NCDC, 2020), and hospital admission rates increased from 9 to 13 per 100 population (NCDC, 2019). The total number of hospitals also grew substantially, with some being individually owned, while others were acquired or established by corporate healthcare networks.

This paper aims to investigate and conceptualize the risks associated with market fragmentation, using the market for inpatient care in Georgia as an example. We describe the market structure for inpatient care, highlighting the high number of relatively small facilities. We then explore the policy drivers of this market structure, and examine its consequences for both patients and the wider healthcare system. We draw on this analysis to develop “**Theories of harm**” for market fragmentation, and identify policy levers to shape the healthcare market to better serve the needs of UHC.

2. Methods

The study involved a mixed-methods design, starting with a cross-sectional assessment of Georgia’s inpatient market structure using various publicly available datasets combined with the patient discharge administrative data secured through data sharing agreement with the Ministry for Internally Displaced Persons from Occupied Territories, Labor, Health and Social Affairs (MoH). This was followed by in-depth interviews (IDIs) and an online survey with health sector stakeholders, to explore the consequences of the market structure for provider behavior, patients, and the wider health system. We focused on the market for inpatient care, as concerns about the consequences of fragmentation are particularly great in this market segment.

2.1. Analysis of inpatient market structure

We defined the product market for inpatient care to encompass the UHC program categories of “emergency inpatient care”, “planned surgeries”, and “labor and C-section” (excluding specialized services such as infectious diseases or those provided by single-specialty hospitals).

We described market structure in terms of distribution by facility size, using two indicators. First we looked at hospital bed size based on data from the National Center for Disease Control and Public Health (NCDC). Secondly, we measured inpatient volumes using administrative inpatient discharge data for all public and private hospitals for 2018 to calculate the mean daily discharges per facility per annum (discharges are used rather than admissions as the latter do not contain information on categorization by case).

The analysis of facilities by bed size and discharges was conducted first considering each hospital as an individual business, and secondly considering those that were part of a hospital network as one business/organisation. We defined “networks” to include facilities that have the same majority owner (individual or a company) and use the same brand name (e.g. JSC Evex Medical Corporation, GEO Hospitals, etc.).

To assess intensity of competition, we measured travel time to the 3rd nearest competitor (other inpatient facility) (Gravelle et al., 2016). We selected this indicator because it does not require the specification of geographical market boundaries which would be challenging to do in this context as patients’ willingness and ability to travel varies considerably by type of inpatient case, with the whole country potentially being the appropriate market for some complex procedures. While previous studies have used distance to nth nearest competitor (Gravelle et al., 2016), we use travel time to incorporate variation in travel speed due to road conditions and traffic. The inpatient facilities were mapped

using ArcGIS™ software, using data and maps from Georgia's Public Registry for facility geolocation, Google Maps for visualization of driving routes and historical driving times, and Open Street Map for driving time calculation. We used an algorithm considering (a) road condition, (b) speed limits on a road segment, and (c) average driving speed based on Google historical traffic patterns. The database of calculated travel times was exported into IBM SPSS Statistics 20™ software for statistical analysis. We report travel time stratified by four categories of settlement size (SS) in terms of inhabitants: SS1 >1 million (Mln) (Tbilisi only), SS2 from 100,000 to <1 Mln, SS3 from 50,000 to <100,000, and SS4 <50,000. 31% of the Georgian population lives in SS1, 21% in SS2s, 17% in SS3s and 31% in SS4s.

Finally, we used the European Health for All (HFA-DB) (World Health Organization, 2018) and the Eurostat database (Eurostat, 2018) to benchmark Georgia's bed numbers, average hospital bed size, bed occupancy rate, and inpatient volumes against European countries. Inpatient volumes were measured using median discharge rates per 100,000 population for specific health conditions, coded using the International Statistical Classification of Diseases and Related Health Problems (ICD-10). The analysis was conducted for the top ten leading causes of hospitalization in Georgia, which comprised 28% of all hospital discharges in 2018.

2.2. Indepth interviews

We conducted semi-structured IDIs during May–June 2021 with 35 purposively selected stakeholders, comprising senior policymakers from Georgia's MoH and its subordinated state entities, Parliament, the National Competition Agency and Ministry of Finance (n = 9); healthcare facility managers (n = 18); representatives from civil society organizations engaged in health policy issues (n = 2); media representatives reporting on healthcare matters (n = 2); hospital and general practice associations (n = 2); and academics working on health policy issues (n = 2).

The IDIs were used to explore key factors explaining the development of this market structure, and its consequences. IDIs were conducted in Georgian by senior researchers, and lasted 1–1.5 h. Due to the COVID-19 pandemic all but two interviews were conducted remotely. Video/audio recordings were made after obtaining informed consent in all but two cases, for which written notes were taken. Recordings were transcribed verbatim. Two team members independently read interview transcripts to develop a coding structure reflecting both the literature on competition (deductive approach) and issues arising from the data (inductive approach). After reconciliation of the coding approach all interviews were independently coded by two researchers using Nvivo12™, and coding was reconciled through an iterative process. Commonly occurring themes and subthemes were then identified.

2.3. Online survey

To further investigate stakeholder views on the operation of the inpatient market, we conducted an anonymous online survey with a wider group of stakeholders. A structured survey tool was developed with closed-ended questions in the Georgian language. The tool used a four-point Likert scale to assess respondents' perceptions and experience of certain harmful practices and health systems risks revealed during the IDIs. After online piloting, the survey was carried out using Survey Monkey™ during 10–25 August 2021. We invited 326 individuals to participate, representing similar groups to those participating in the IDIs (policymakers, health facility managers and staff, media and civil society representatives). We received 94 complete and 18 partial responses (34.4% response rate). Survey data were analyzed using IBM SPSS Statistics 20 with the Mann-Whitney U test to assess the significance of the difference between respondent groups.

Ethical approval was obtained from the institutional review boards of LSHTM (UK) (Ethics Ref: 22456) and the Georgian National Center for

Disease Control and Public Health (NCDC) (IRB # 2020-029). Informed written consent was obtained from all respondents for the IDIs and on-line survey.

3. Results

3.1. Inpatient market structure

In 2018, Georgia had 263 active inpatient facilities (11% public, 89% private). Of these, 52% were stand-alone hospitals, with the remainder being members of hospital networks. We categorized the networks as large (>10 facilities), medium (4–9 facilities), and small (2–3 facilities), leading to the identification of 4 large, 4 medium, and 19 small networks. Fig. 1 shows the number of hospitals in each network category. Standalone hospitals accounted for 52% of discharges, small networks 10%, medium networks 3% and large networks 35%.

The mean bed size per facility was 58 and the median 31. More than two fifths of inpatient facilities (41%) had less than 25 hospital beds, and 11% had less than 10 beds (Fig. 2a).

The mean number of daily discharges per hospital was 4.5 and the median 1.3. Facilities with less than five discharges per day accounted for 69% of the market, while 18% had 5–9, and 11% 10–19, with only 2% having 20 or over (Fig. 3a). Facilities with less than 10 discharges per day accounted for 53% of all discharges (Fig. 3b).

Considering networks as a single organisation, the mean bed size per organization was 93 and the median 40. 23% of inpatient organizations had less than 25 beds, and 11% less than 10 (Fig. 2b). The mean number of daily discharges per organization was 7.1 and the median 2.8. Organizations with less than 10 discharges per day accounted for 32% of all discharges (Fig. 3d).

Fig. 4 shows travel time to the third nearest competitor hospital for each facility in 2018. Across all facilities, the median travel time to the third nearest competitor was 5 min. Median travel time was 3 min in settlements with over a million inhabitants, 5 min in settlements with 100,000 to a million inhabitants, and 10 min in settlements with 50,000 to 99,000 inhabitants. Only in remote rural areas with less than 50,000 inhabitants per settlement was the median travel time to the third nearest competitor substantially higher at 33 min.

3.2. Drivers of market structure

The IDIs revealed three drivers that have jointly played a key role in the growth in numbers of small private inpatient providers. Firstly, several IDI respondents stated that increased spending due to the UHC program introduction in 2013 and a general promise of free (or subsidized) entitlements attracted patients to consume more inpatient services. This expectation of free or subsidized care developed in an environment where health problems had accumulated due to the high financial and geographic access barriers before the UHC program. Subsidized entitlements led to increased service utilization, which also afforded potential for higher returns on investment and made the health sector attractive to investors. Furthermore, "renowned" doctors with a good reputation in the community often obtained finance from a private equity investor or through a private bank loan to establish their own facility.

Secondly, most IDI respondents felt that government market entry regulations were ineffective in balancing the number of service providers in the marketplace relative to the population's health needs. Thus, growth in demand, along with weak market entry regulations, led to substantial growth in facility numbers.

"UHC program introduction was the main driver attracting private investors to the market, and without adequate market entry regulations, the flood gates were opened." Provider

"... contributing factor of existing market structure is market entry regulations which only set minimal requirements but does not consider

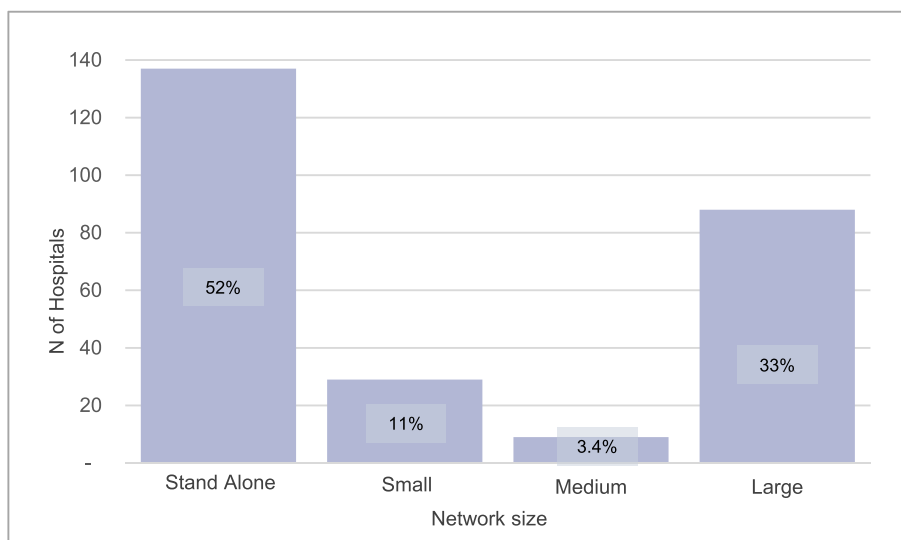


Fig. 1. Distribution of Hospitals by Network size.

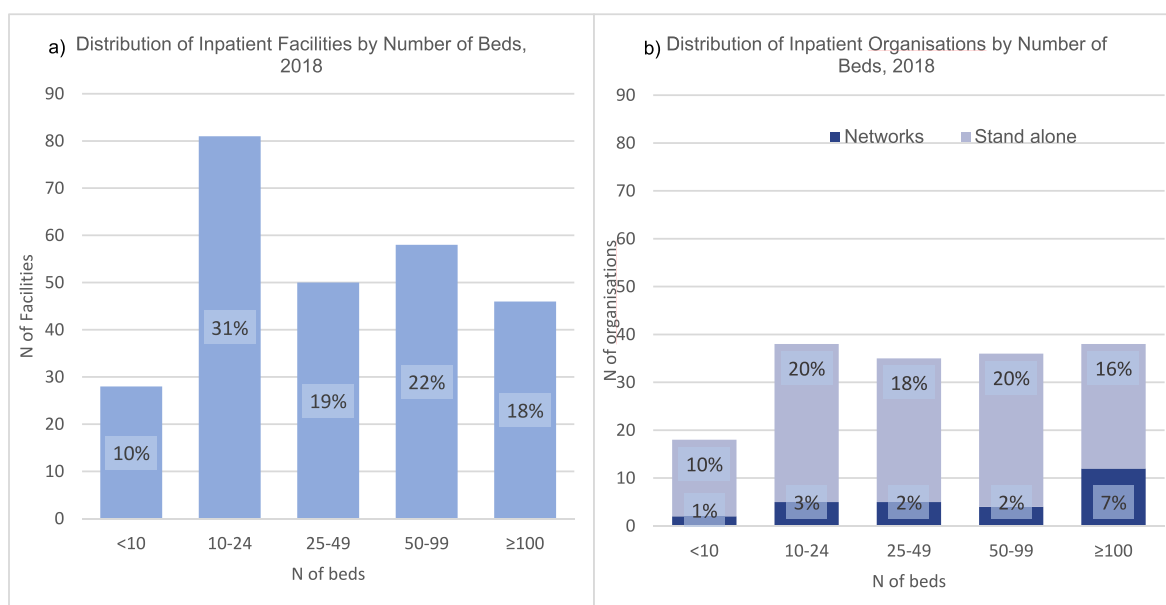


Fig. 2. Distribution of inpatient facilities by number of beds (a) considering each hospital individually, and (b) grouping networked facilities as single organizations, 2018

population health needs before granting market entry rights” Policy Maker

Thirdly, IDI respondents argued that the single public purchaser, the NHA, did not play a strategic purchaser role, but instead contracted all providers in the market, without monitoring the utilization or quality of delivered services, thus encouraging proliferation in facility numbers. The NHA’s role was said to be limited to checking invoices for minor clerical errors, discrepancies or rule violations.

3.3. Consequences of market structure

IDI respondents highlighted both positive and negative consequences of a market structure characterized by high numbers of small providers. On the positive side, the growth in facility numbers had increased geographic access to care and choice for patients. Private investors were said to have developed previously unavailable services in some areas, encouraging inpatient utilization. Investments in new diagnostic and

curative services afforded “one-stop shopping” to patients, offering access to multiple services in a centralized location close to their residence instead of referrals to multiple facilities with longer travel times.

The effect of the market conditions on staff professional development was said to vary depending on the organization’s size. Although the state did not require continuous professional development (CPD), bigger networks were said to have become more interested in training their staff, introducing corporate-level CPD mandates, and organizing, financing, and providing training with their own resources. However, in standalone and small facilities, staff training was said to be infeasible due to constrained financial and administrative resources. The only training staff at these facilities were said to receive was provided by equipment suppliers when the equipment was procured or from pharmaceutical companies that link knowledge dissemination with drug marketing. Such training was said to be used by pharma companies to establish closer personal contact with physicians and eventually use them as a “marketing force” for their drugs, frequently with financial

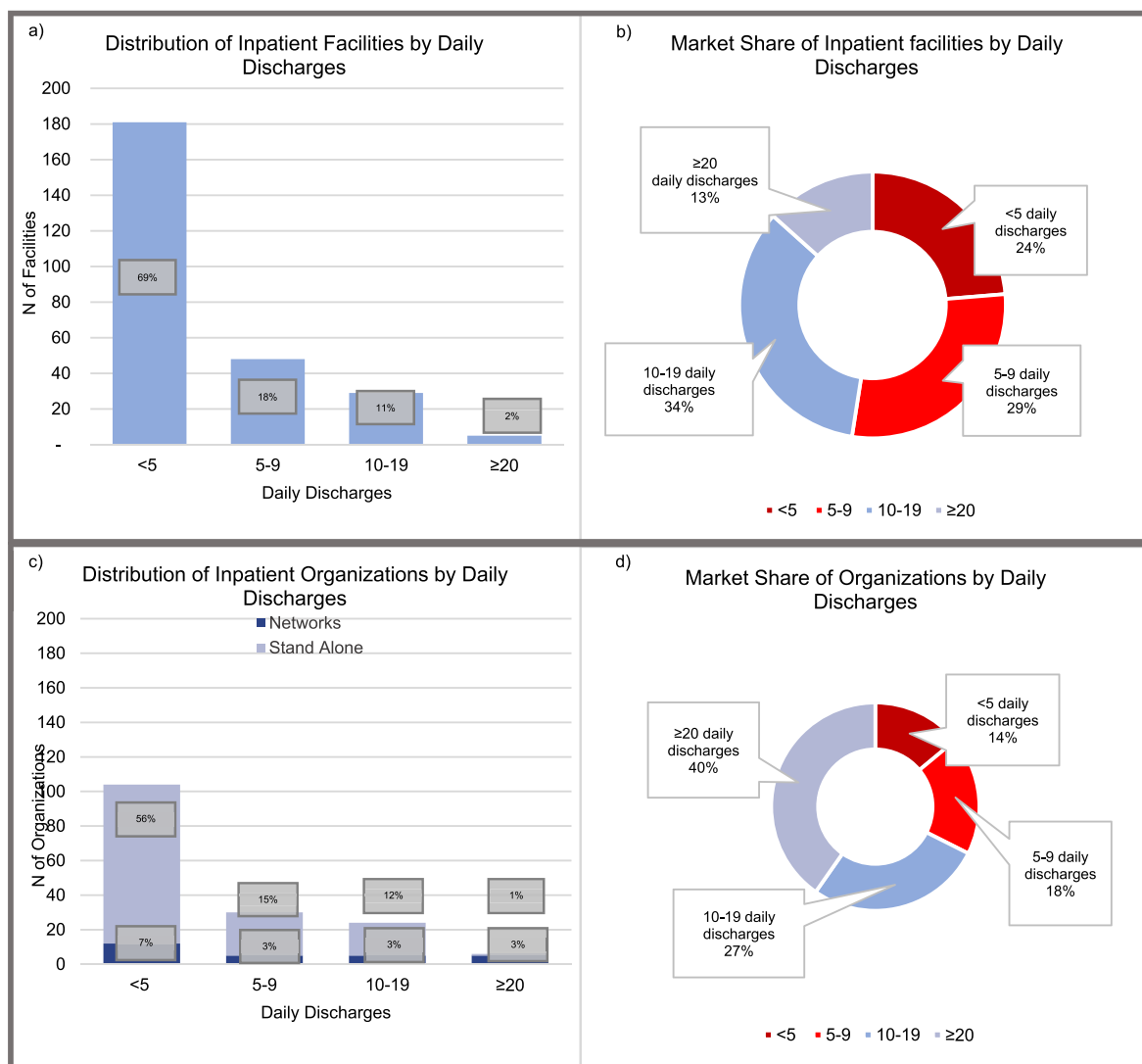


Fig. 3. Distribution of facilities (panels a and b) and inpatient organizations (panels c and d) by daily discharges.

commissions. One respondent also noted that low patient volumes in small facilities could be associated with low quality because health workers did not get enough experience with serious cases.

“... it is irrational how someone can open cardio-surgical service in [small town] considering the number of inhabitants, population density, and age structure. The predicted patient load will be low, and the medical staff will lose skills, negatively affecting the quality of care.” MoH Representative

The growth in facility numbers was said to have intensified human resource supply challenges, especially in remote locations, where the environment was less attractive than in large urban settings, and for the less-developed or less-attractive medical professions. Respondents noted that the government failed to actively manage and regulate the health workforce, which led to these labor supply shortages.

“The government must play an active planning and regulatory role regulating not only facilities but also human resources supply to the market using the single uniform registry of human resources to maintain proper doctor to population ratio.” Provider

Consequently, existing labor market conditions “forced” some health workers, such as intensive care doctors, general practitioners, ambulance workers, young doctors, and nurses (who are relatively poorly paid), to seek multiple jobs in different facilities.

“In the intensive care unit, I have doctors who, after spending 24 hours at the hospital, do not go home but go to work at another hospital and/or ambulance. Thus, when the overworked staff treats the patient, the quality of our services suffers.” Provider

While the “famous” surgeons and doctors, who are major revenue generators because they are well-known by the public, were contractually restricted to working with only one employer, intensive care staff, nurses, and other doctors were contractually able to work in several places, including with competitors.

“We try to contractually restrict our surgeon from working for a competitor so as not to lose the marketing edge of our hospital, but junior doctors and some specialists in an outpatient department that we only have one or two in the whole district are allowed to work at other places.” Provider

Thus, while the growth in facility numbers increased geographical accessibility for patients, qualified staff shortages limited the potential value of the services delivered.

“In some specialties, doctors are not enough to provide full-time service in so many healthcare facilities. So, some doctors work in 5-6 facilities and are exhausted as they must work in multiple locations.” Policy Maker

There were also reported to be negative consequences of the

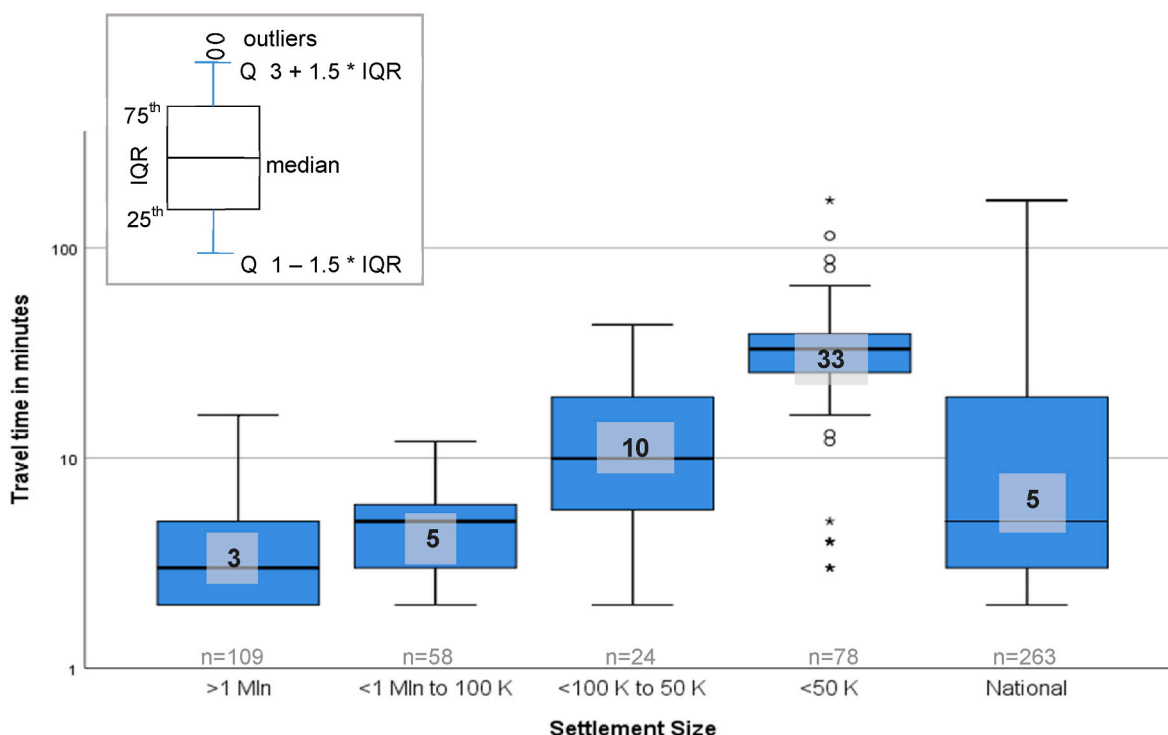


Fig. 4. Travel time to the 3rd nearest competitor hospital by settlement size, 2018 (log scale).

increases in facility numbers and service utilization on the financial sustainability of the UHC program budget. In response, the state froze provider reimbursement at the tariffs introduced in 2013. In some instances, they even lowered tariffs, threatening the financial survival of providers in the highly competitive marketplace, who were facing ever-rising costs of service provision due to general and medical inflation, with particularly high price increases in medical devices. Most providers felt strongly about these issues, arguing that policy decisions adversely affected service quality and out-of-pocket payments.

“The state has established fixed medical service prices and told us to treat patients with this amount. We implemented practices we would not have thought of before to deal with financial challenges. We purchased low-quality, low-cost materials, but we are not using them. Instead, we give a patient choice between state-financed low-quality inputs vs. high-quality ones, but with co-payment by them [patient].” Provider

“We must save on everything, purchasing lower priced surgical material, underpaying staff, forcing them to work at several facilities, which negatively affect quality.” Provider

These financial challenges were also said to push providers to induce demand by, for example, prescribing unnecessary diagnostic services or increasing hospital admissions for cases covered by the UHC program. Such practices allowed providers to generate additional income either through the UHC program or through out-of-pocket payments.

“We ended up with perverse incentives in the market where unethical behavior for patients’ recruitment or over-prescription is encouraged with a little effect on quality”. Legislature

“Providers capable of manipulating diagnosis and charging codes are better placed to compensate for losses arising from low reimbursement from the state.” Provider

Aggressive marketing was said to be used to compete for the limited pool of patients, including offering free services or time-limited price reduction campaigns. One strategy used mainly (but not only) by

networks was to bring “famous” doctors from the Capital or other big cities to increase patient flow. Approaches to attracting patients from other regions included marketing campaigns and free specialty outreach consultations. Some promotional practices, such as monetary commissions for referrals, primarily practiced by individual doctors, were considered unethical by some respondents. However, the state did not have regulations to prevent or impose sanctions when such practices were spotted. These aggressive marketing practices were said to lead to distortions and inefficiencies in the health system:

“... inpatient providers try to recruit patients by all means, which means that care coordination and patient pathway in the system is distorted. We know that around 80% of individuals should be treated at the primary healthcare level, and the remaining can be referred to the hospital. Only 5% can be referred from the hospital to tertiary care, but in our country, this is not happening in this way.” Provider

We asked IDI respondents whether the sheer number of private facilities increased the cost and logistic challenges of contracting and regulating facilities under the UHC program. Interestingly, the costs of managing many contractors/facilities were not perceived as a problem by the stewards of the sector – likely because so little stewardship was undertaken. Almost all respondents noted that there was very little engagement of NHA or senior ministry staff with the providers. Thus, basically, the role of the government was limited to licensing, invoice checking, and processing reimbursements without proper utilization and/or service quality monitoring.

“If the market was properly monitored, the cost of it should be expensive for the government agencies The MoH officials’ proud statement of spending 0.001% of the budget on administration leads to poor results of the UHC program.” Legislature

“I think providers are not being monitored well, allowing providers to fake records and generate more revenues from UHCP.” Media representative

Respondents also noted that the NHA’s *modus operandi* was directive

and punitive (most likely reflecting the Soviet legacy) and not collaborative, with limited space and mechanisms for voicing concerns and jointly seeking solutions.

These findings from the IDIs on the prevalence of unethical behavior were confirmed by the online survey results, with particularly high rates of such harmful practices reported by respondents not directly involved in service provision (government staff and other experts, termed non-providers). However, providers themselves also reported these practices as common (Table 1). 86.7% of non-providers and 56.5% of providers considered prescribing unnecessary tests and/or diagnostics a common practice to maximize provider income. Over half of the respondents (76.1% of non-providers and 55.1% of providers) agreed that providers made diagnoses more severe to generate higher income from the government, and 57.8% of non-providers and 44.9% of providers said that unnecessary hospitalization of patients was a common feature in Georgia's healthcare market. Finally, referring a patient to a higher level of care in exchange for commissions was also considered common practice by respondents.

To further explore the potential consequences of the market structure, we benchmarked key inpatient indicators against European countries. Fig. 5 shows that Georgia has a relatively high number of beds per 100,000 population, and that these are severely underutilized, with a bed occupancy rate lower than all the European comparators at 51%, compared with the European average of 73%. Fig. 6 demonstrates that Georgia's inpatient volumes per 100,000 population measured by the discharge rates for the top ten causes of hospitalizations were all significantly above the European median rates. This supports the perceptions of excessive inpatient admissions reported in the IDIs and online survey. For example, for pneumonia in Georgia there were 927 inpatient discharges per 100,000 population, compared with a median of 339 per 100,000 in the European countries. Fig. 7 highlights that the mean number of five daily discharges per acute care hospital in Georgia is nearly seven times lower than the European average of 31. Likewise, the mean number of beds per hospital in Georgia is notably low at 58, in contrast to the European average of 297.

4. Discussion

We analyzed data to describe the market structure for inpatient care in Georgia, and used qualitative and quantitative data to explore the consequences of the market structure, identifying a range of harms related to provider behaviour, patient care and the health system more broadly. The study adds to the very limited literature on healthcare market structure and competition in LMICs (Bennett, 1999; Das et al., 2022; Gautham et al., 2019; Nakamba et al., 2002; Pan et al., 2015, 2016), with the mix of methods allowing us to triangulate across multiple indicators and data sources. While one might be concerned that interview data could be subject to social desirability bias, particularly on

the part of healthcare providers, in practice, respondents were willing to discuss sensitive issues and unethical behavior during both IDIs and the anonymous online survey. Nonetheless, some limitations should be noted. First, the market structure analysis is based on data from 2018, while the IDIs and survey were conducted in 2021. We decided against updating the market structure analysis, given the atypical patterns of inpatient care observed during the COVID-19 pandemic. Secondly, our data collection included only the perspectives of providers and policy stakeholders and did not capture patient perspectives. Thirdly, we focused on horizontal concentration measures and did not assess the extent of vertical integration within the healthcare system, though concerns have been raised in Georgian media about the vertical links between healthcare facilities, pharmacies, and health insurance companies affording significant market power to vertically integrated networks. Finally, we have not quantitatively assessed the relationship between market structure and outcomes such as quality of care, costs, or health outcomes, rather drawing on the perceptions of providers and other stakeholders. Suitable data were not available for a quantitative longitudinal analysis. A cross-sectional analysis would have required comparison across multiple geographical markets, but such distinct geographical markets did not exist for inpatient care, reflecting the small size of the country, and the freedom to choose any inpatient facility under the UHC program, meaning that whole regions or even the whole country was the relevant geographical market for some conditions.

Our analysis demonstrated that the market for inpatient care in Georgia is dominated by a large number of relatively small facilities, the majority of which are standalone independent organizations. The mean number of beds per facility (58) was five times smaller than the mean across European comparators (297). The small size of operation was even more evident from discharge data (median of 1.3 discharges per hospital per day), reflecting a bed occupancy rate lower than all European comparators. The multitude of facilities and resulting intensity of competition was further demonstrated by the short travel time from facilities to their 3rd nearest competitor, with a median of 5 min or less for 52% of facilities, and a median of 10 min for a further 17%. This low concentration is attenuated to some degree by the presence of hospital networks, with a third of inpatient facilities being in 4 large networks containing over 10 facilities each, and 14% of facilities being in small and medium sized networks. However, even considering a network as a single organization, median beds and discharges per organization remained low at 40 beds and 2.8 discharges per day.

Inpatient markets with very high numbers of small facilities are not uncommon in LMICs (Mackintosh et al., 2016; Ogunbekun et al., 1999). For example, in Uttar Pradesh, India, Gautham et al. identified an extremely high and rapidly increasing number of small private facilities, nearly all independently owned, and experiencing intense competition in urban and peri-urban areas (Gautham et al., 2019). In Kenya's capital city of Nairobi, Cohen et al. identified hundreds of places to deliver a

Table 1
Reported frequency of adverse behaviors reported in online survey.

Statement	N	Respondent Group	Common	Occasionally	Never	Do not know	P value ^a
Providers prescribe unnecessary tests and/or diagnostics to maximize their income from patients.	46	Health Facility Managers & Staff	56.5%	37.0%	2.2%	4.3%	0.003
	45	Respondents not directly involved in service provision ^b	86.7%	13.3%	0.0%	0.0%	
Health care providers try to make diagnosis more severe than in reality to receive higher payments from the Government.	49	Health Facility Managers & Staff	55.1%	38.8%	4.1%	2.0%	0.023
	46	Respondents not directly involved in service provision	76.1%	21.7%	0.0%	2.2%	
Providers unnecessarily hospitalize patients.	49	Health Facility Managers & Staff	44.9%	42.9%	2.0%	10.2%	0.413
	45	Respondents not directly involved in service provision	57.8%	42.2%	0.0%	0.0%	
Providers refer patients to a higher level of care in exchange for kickbacks.	49	Health Facility Managers & Staff	44.9%	49.0%	2.0%	4.1%	0.004
	46	Respondents not directly involved in service provision	73.9%	23.9%	0.0%	2.2%	

^a P value for test of significant difference between the two respondent groups excluding responses of "Do not know."

^b Representatives from government agencies, civil society, media and academia.

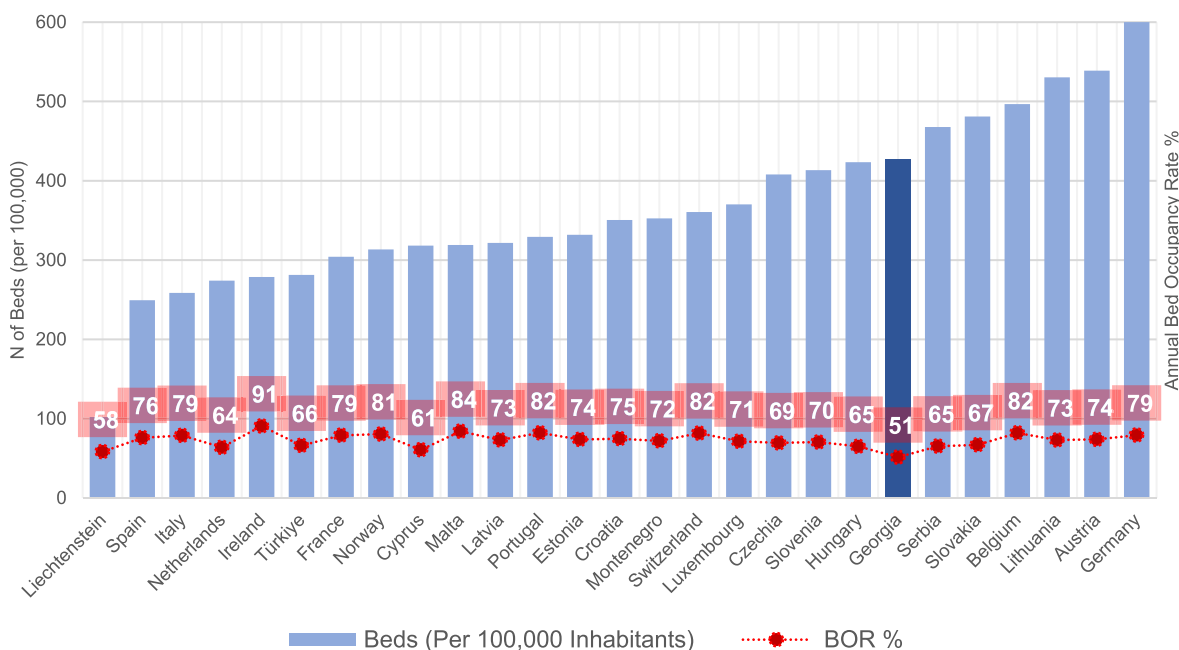


Fig. 5. Comparison of Georgia’s acute curative care beds per 100,000 inhabitants and bed occupancy rate (BOR) with European countries, 2018
 Note: Data for European countries sourced from (Eurostat, 2018).

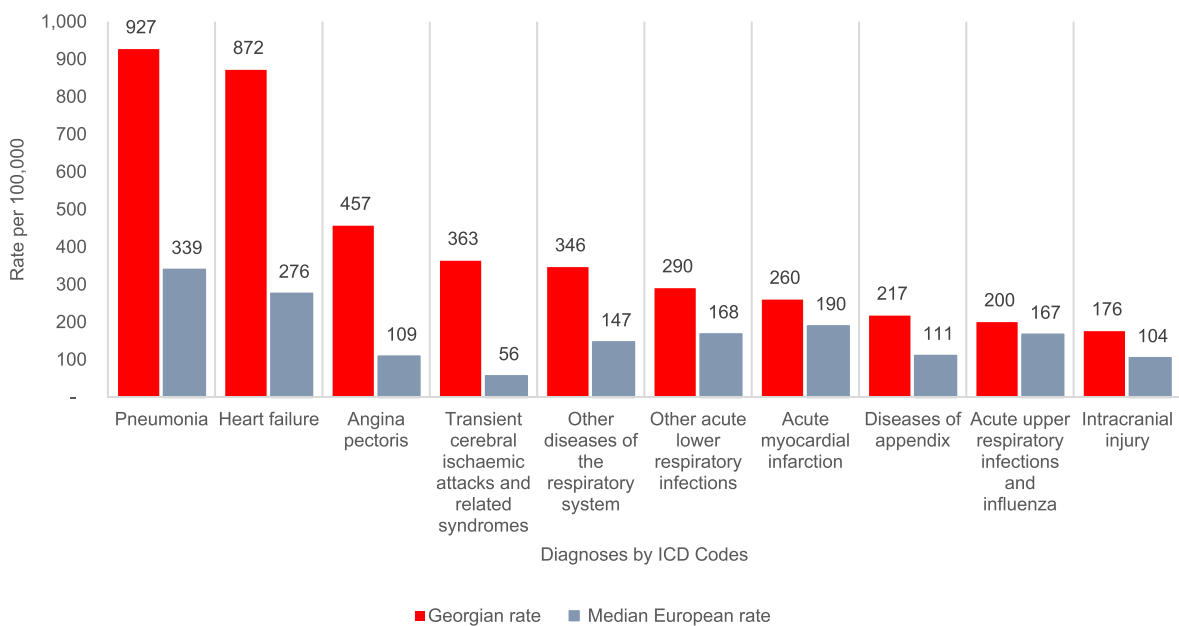


Fig. 6. Comparison of Georgian hospital discharge rates with median European countries discharge rates, 2018
 Note: Data for European countries sourced from (Eurostat, 2018).

baby, with many considered very low quality (Cohen et al., 2017).

The Georgian analysis raises the question of whether a market with such excess capacity would naturally adjust over time to a new equilibrium with facilities reducing excess bed capacity, merging and/or exiting the market. However, there has been no long-term decline in numbers of hospitals or beds since 2018 (Galt and Taggart, 2023), and IDI respondents did not report significant numbers of mergers or closures. It is unclear why the market fails to adjust, but possible reasons might include the role of demand inducement and cost-cutting strategies in allowing low-capacity facilities to stay in business, profit satisfying rather than profit maximizing behaviour by smaller, family-owned businesses, and the universal contracting of facilities under the UHC

program.

The Georgian inpatient market structure was said to have some positive impacts. The high number of facilities was argued to increase geographical accessibility, reduce travel times, and increase patient choice. In addition, it has been argued that the hospital sector’s excess bed capacity was an important asset during the COVID-19 pandemic, allowing the government to mobilize more than 7,000 public and private beds during 2020 (Government of Georgia, 2021)

However, our data highlighted a wide range of significant negative consequences arising from the market structure for patients, providers, and the health system. Following the tradition among competition authorities of setting out “theories of harm” of high market concentration

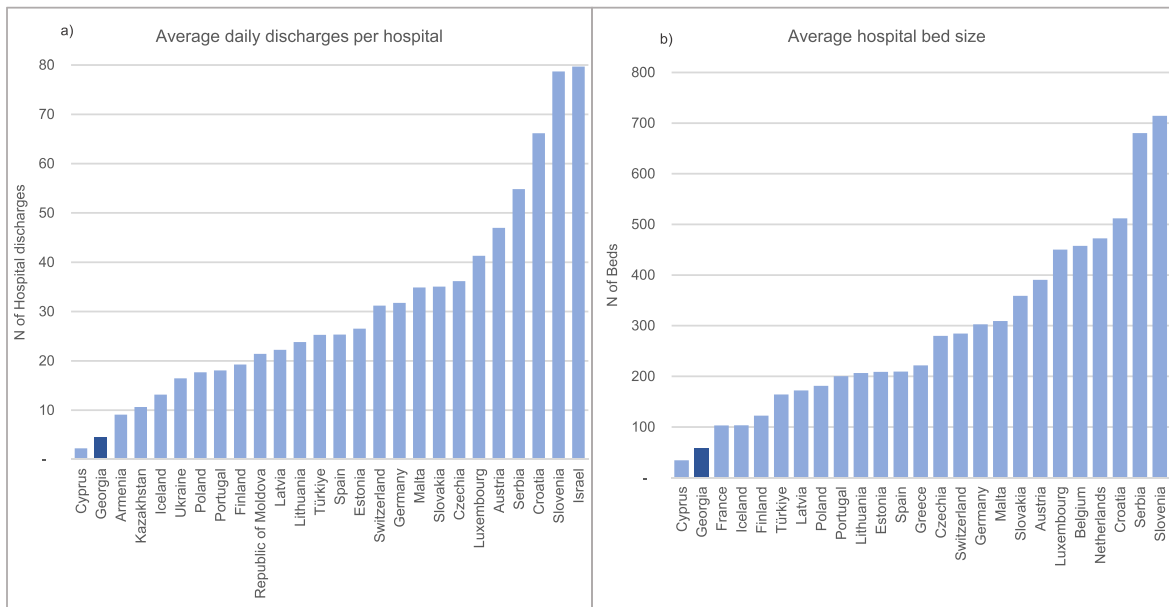


Fig. 7. Comparison of Georgia with European countries for (a) mean daily discharges per acute care hospital and (b) mean hospital acute curative care bed size, 2018. Note: Number of acute hospitals sourced from WHO Health for All database (World Health Organization, 2014), number of acute care hospital discharges sourced from WHO Health for All database (World Health Organization, 2018), and number of curative care hospital beds sourced from Eurostat (Eurostat, 2018).

(Ho and Hamilton, 2000; Schmid and Ulrich, 2013; U.S. Department of Justice and the Federal Trade Commission, 2023), we have used these findings and the wider literature to develop corresponding “theories of harm” of harmfully low concentration which we term fragmentation (Fig. 8). We organize the risks around three broad areas of inefficiency, poor quality, and governance challenges, discussing each in turn.

While there are concerns that high concentration can lead to inefficiency due to monopoly pricing and reduced incentives for enhancing productivity, fragmented markets also exhibit important negative effects on efficiency and cost containment. First, as shown in Georgia, a high number of facilities can be associated with a severely underutilized stock of hospital beds. One would also expect such small

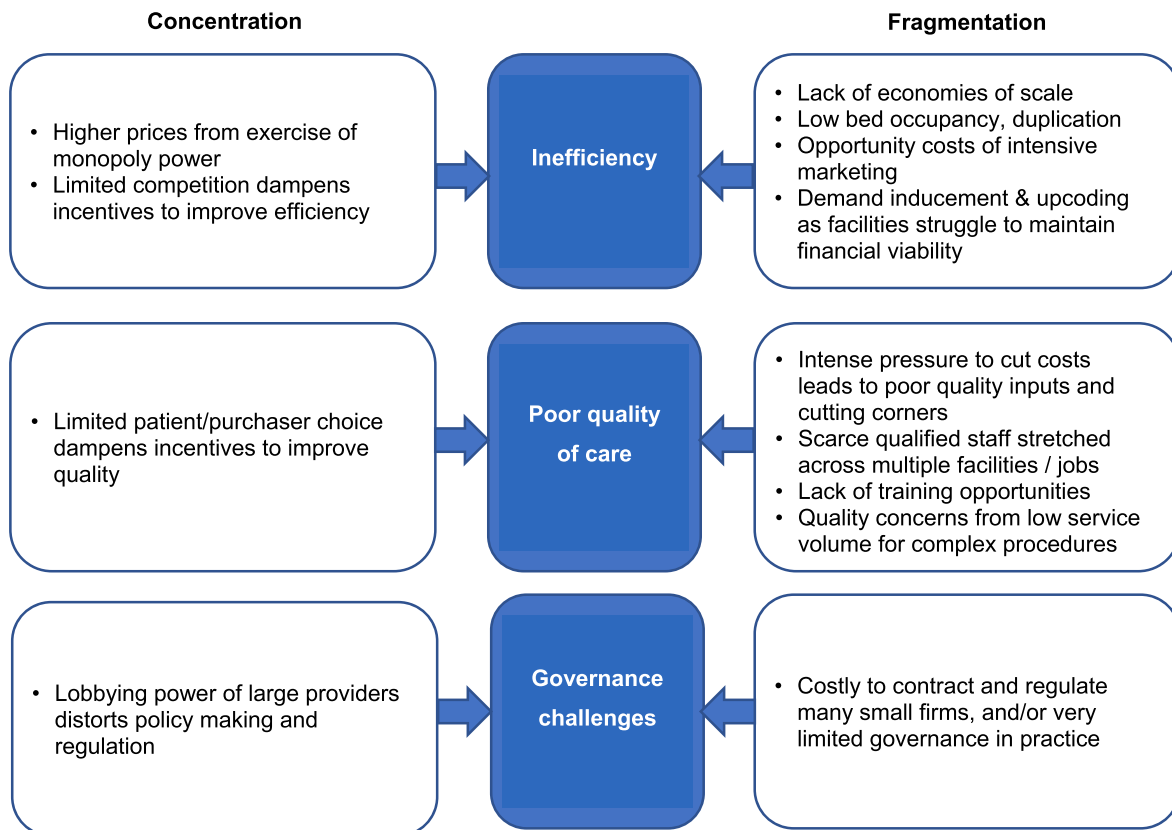


Fig. 8. Theories of harm from concentration and fragmentation.

facilities to be unable to take advantage of economies of scale, for example in facility management and large scale procurement, and to result in duplication of valuable equipment and infrastructure (Giancotti et al., 2017). In Georgia the intense competition between facilities led them to invest in intensive marketing activities, consuming resources that could otherwise potentially have been used to improve patient care. Similar high intensity marketing activities were also reported in Uttar Pradesh, through the use of promotional “health camps”, employment of full time marketing staff, and payment of commissions for patient referrals (Gautham et al., 2019). Despite these marketing activities, Georgian facilities struggled to maintain financial viability, with a recent study finding that in 2019, 29% of medical establishments were loss-making and that net profit margins were 4%, far below the average of 11% for the whole business sector (Curatio International Foundation and Galt and Taggart, 2021)

Furthermore, Georgian respondents indicated that over-supply of inpatient services, combined with unrealistically low UHC program reimbursement rates, encouraged substantial demand inducement and upcoding. One indication of this was Georgia’s very high inpatient utilization rates compared to European countries (Fig. 6). Induced demand, upcoding and unnecessary admissions were likely associated with the high out-of-pocket payments for patients observed in Georgia, increasing the risk of impoverishment (Tvaliashvili et al., 2021) and inflated costs for the publicly-funded UHC programme. Overprovision and unnecessary care have been described as a major concern for both the efficiency and quality of healthcare provision globally (Albarqouni et al., 2022; Brownlee et al., 2017), and has numerous causes (Saini et al., 2017), but it does appear that the Georgian market structure specifically incentivized this.

While the lack of competition in a highly concentrated market can dampen incentives to improve quality, we found that a highly fragmented market posed grave challenges for the potential for providers to achieve even minimum quality levels. Our findings indicated that to cope with their challenging financial situation, hospital managers faced intense pressure to reduce costs by purchasing low-priced and probably low-quality inputs (Commersant, 2022) and by underpaying staff such as junior doctors and nurses. As a result many of these staff worked in multiple jobs, with uncoordinated shifts, and excessive hours, risking service quality for patients. Similar practices involving staff working across multiple private facilities have been noted in other settings, raising concerns about the timeliness and continuity of care, and maintenance of quality standards (Gautham et al., 2019).

Another key quality concern was the lack of professional CPD in small and standalone facilities, reflecting their limited resources, which would likely lead to challenges in sustaining the staff skills necessary for quality service provision. While some bigger networks organized and mandated free CPD for their staff, in the majority of facilities, providers obtained most of their information and training from commercial sources.

There is an ongoing debate in health care about whether a positive relationship between patient volume and health outcomes exists, and if so, what minimum volume is required for different cases (Scharfe et al., 2023). Such associations have been demonstrated for many surgical and non-surgical procedures, including for maternity care in African and high income settings (Kruk et al., 2016; Morche et al., 2016; Pieper et al., 2015). Although the causal mechanisms are not well understood, one commonly cited is the “practice makes perfect” hypothesis, where more experience from a higher volume of interventions results in higher proficiency and better skills (Scharfe et al., 2023). In countries such as Germany, the USA, Canada, the UK and Switzerland, minimum volume standards have been instituted for some procedures (Morche et al., 2016). While this issue was only raised by one MoH respondent in the Georgia study, the extremely low overall inpatient volumes in most facilities suggest that they could be having an important negative impact on healthcare quality, particularly for complex procedures.

Turning to governance issues, there are concerns that both high

concentration and fragmentation may affect the state’s capacity for effective stewardship. In a highly concentrated, oligopolistic market, there are concerns that the lobbying power of large providers may distort policy making and regulation, though effective provider organization may also facilitate this in less concentrated markets (Bloom et al., 2014; WHO Regional Office for Europe, 2023). In a fragmented market, the very high number of small to medium-sized independent organizations is likely to make regulatory inspection and enforcement difficult and costly (Lagomarsino et al., 2009). In addition, for an institutional purchaser, the costs and logistical demands of establishing and monitoring so many contracts are likely to be very high (Suchman et al., 2021). In practice, in Georgia, these costs had not been incurred because, partly reflecting these challenges, very little oversight of facilities was taking place.

While the framework in Fig. 8 emphasizes the role of market structure in influencing efficiency, quality and governance, these effects are mediated by the government’s regulatory and purchasing policies, as clearly indicated from the Georgian case. Weak regulation of market entry and universal contracting of all facilities applying to the UHC program facilitated the development of the fragmented structure, and failed to control its potentially negative consequences for quality, efficiency and financial protection. This was compounded by a failure to increase UHC program reimbursement rates in line with inflation, the system of provider payment, and very limited monitoring and audit by the purchaser (Tvaliashvili et al., 2021), with similar problems documented in other settings (Rannan-Eliya et al., 2013). Other authors have also highlighted inadequate awareness of the population/patient on their entitlements as facilitating unethical behaviour and inappropriate charging (Dupas and Jain, 2023; Glassman et al., 2016).

Our analysis points to several potential areas for policy intervention to address the harms from fragmented markets. First, strategies to encourage greater consolidation in the inpatient market should be implemented to improve efficiency, enhance quality and facilitate governance. While the European literature does not indicate that mergers have improved quality of care or financial performance (Propper, 2018), these analyses have considered mergers of much larger hospitals (e.g. mean of over 600 beds (Gaynor et al., 2012)) than the very small facilities described in this analysis. Governments can indirectly shape the market by using regulatory levers to enforce higher standards regarding staffing, CPD, infrastructure and equipment, which could lead small suppliers that cannot meet these to close, join networks, or merge with other facilities. Indeed in 2024 Georgia did specify additional regulatory requirement for intensive care facilities (Government of Georgia, 2023). However, the challenges of implementing and enforcing regulation in a context of limited capacity and vulnerability to regulatory capture should not be underestimated (Lagomarsino et al., 2009). The state purchaser could also more directly shape the market by requiring minimum service volumes for UHC program empanelment, or by requiring Certificates of Need to create or expand health facilities (Conover and Bailey, 2020). In addition, governments may wish to follow other countries by mandating minimum volume standards for specific procedures. However, experience has shown that downsizing an existing market is challenging to achieve, while care must be taken to ensure that this does not lead to excessive concentration and the risk of monopoly power, diseconomies of scale, or unacceptable effects on patient choice or geographic access (Siciliani et al., 2022). It is notable that policy preferences around small-scale “community hospitals” have ebbed and flowed, with recent increased interest in their value in China and several European countries (National Health Commission, 2021; Pitchforth et al., 2017).

Consolidation alone would not be sufficient to address the harms identified; additional reforms to the UHC program are required to ensure that providers face appropriate incentives. Central among these would be ensuring that reimbursement rates cover service delivery costs, at least of larger scale, higher occupancy providers. Other key reforms would involve including quality and service targets in contracts,

effective audit of care provided, incentive-compatible provider payment mechanisms, increasing patient awareness of benefits and feedback mechanisms, and enhancing the government's capacity for contracting (Gatome-Munyua et al., 2022; WHO Regional Office for Europe, 2023).

Interestingly, Georgia has used regulatory and minimum volume standards in an attempt to shape and consolidate the market for maternal and newborn care. Starting with a pilot in 2015, maternity facilities/departments were assessed and only contracted if they met standards for level I, II or III facilities. The requirements for basic-level I antenatal care providers, that manage uncomplicated cases, were related to infrastructure and equipment, staffing and provision of services such as lab tests. More specialized level II and III facilities were required to have ≥ 1800 annual deliveries and a neonatal intensive care unit. The only exceptions were for facilities with no other level III facility within 120 min travel time or those serving patients living in Russian-occupied territories (Minister of Georgia, 2015). This has led to substantial market consolidation; initially only 70 out of 107 facilities were contracted (UNICEF, 2017) and since 2019, this number has further reduced to 49 (National Health Agency, 2024). However, no evidence is available on the impact on quality of care, efficiency and user charges. A priority for future research should be an in-depth study to explore the effects of this initiative, and the policy environment and processes that facilitated it, to assess the lessons for general inpatient care.

5. Conclusions

The Georgian inpatient market is dominated by a large number of relatively small facilities, mitigated to only a limited degree by the emergence of hospital networks. We characterize the market as “fragmented”, reflecting the wide range of market failures, regulatory failures and other efficiency concerns that arise in markets dominated by a high number of small providers operating below the minimum scale necessary for delivering efficient and quality care. Similarly fragmented markets are found in many LMIC health systems with large private sectors. The interplay of a fragmented market structure with inadequate regulatory and purchasing mechanisms is likely to have a number of negative outcomes for both patients and the health system more broadly. We have drawn on this experience to develop Theories of Harm from market fragmentation, that parallel the Theories of Harm used for market concentration, emphasizing the potential risks for inefficiency, poor quality and governance problems. Developing a high quality, efficient health system in Georgia is likely to require greater consolidation, while balancing risks from high concentration or restricted geographical access. Policy makers have the power to shape these market structures through their regulatory, financing and purchasing strategies.

CRedit authorship contribution statement

Mari Tvaliashvili: Writing – original draft, Investigation, Formal analysis, Data curation. **Lela Sulaberidze:** Investigation, Formal analysis. **Catherine Goodman:** Writing – review & editing, Validation, Supervision, Conceptualization. **Kara Hanson:** Writing – review & editing, Validation, Supervision, Conceptualization. **George Gotsadze:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work provided in this paper.

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Data availability

Due to the sensitive nature of the data both quantitative and qualitative data remains confidential.

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