Political Competition and Public Healthcare: Evidence from India*

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Abstract

In this paper, we examine the causal effect of political competition on public provision of healthcare. Specifically, we investigate whether the effect of political competition on more visible public goods (e.g. health centre access) differs from its impact on less visible public goods (e.g. health centre capacity such as doctors, medical supplies, etc.). Using granular data from three recent waves of the Indian District Level Household Survey (DLHS) during 2002-2013 and an instrumental variable approach, we find that incumbents respond to electoral competition, measured as the effective number of parties (ENP), by trading-off less visible health centre capacity for more visible access to health centres. We provide suggestive evidence that focusing on more visible health centres boosts the incumbent party's re-election prospects providing a clear motive for incumbent's action. In addition, we examine the effect of election-year cycles and the role of political alignment in healthcare provision and find compelling evidence of a political economic mechanism at work. By contrast, political competition has no measurable impact on key health outcomes. We conduct several robustness checks to ensure that our estimates are reliable. Thus, our results suggest that electoral competition must be accompanied by strong checks on accountability to improve health outcomes.

1 Introduction

This paper examines the political economy of healthcare provision. We focus on the role of electoral competition and consider how specific features of public goods[1], in particular, its visibility affects the size and composition of its provision. The public provision of healthcare is common in democracies. This is mainly due to the high

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[1]We refer to pure public goods and publicly provided private goods as 'public goods' in this paper noting that they differ somewhat in their excludability and non-rivalry.

positive externality associated with healthcare spending. For instance, vaccinations not only save the lives of the people who are vaccinated but also exert a positive externality on the wider population by preventing the spread of infectious diseases. Under such circumstances, the private sector will under-provide healthcare and government interventions to address the shortfall will increase overall welfare. Besides efficiency concerns, issues surrounding equity motivate public spending in healthcare. The huge deficiencies in healthcare access and quality of services (e.g. Fullman et al., 2018) alongside poor health outcomes (e.g. Black et al., 2003) in developing countries has received widespread attention. That poor health outcomes are due to a lack of resources is not a convincing explanation since low-cost interventions exist that can avert most deaths (Cutler et al., 2006). Instead, the evidence points toward political failure (Besley and Kudamatsu, 2006; Keefer and Khemani, 2005; Bhalotra and Clots-Figueras, 2014). But, the idea that the (lack of) visibility of certain public goods can distort the composition of healthcare provision which then creates inefficiencies in outcome has not received concentrated attention. We address this gap and study whether the causal effect of electoral competition on healthcare provision depends on the visibility of public goods and provide suggestive evidence regarding the key political economic mechanisms at work.

We view the inadequacy of healthcare provision through the lens of political economics. In particular, we examine how political competition affects the public provision of healthcare in India – a geographically large country with a firmly established democracy. The focus on a single country over time is advantageous because it presents a uniform set of legislative procedures and governance structures (e.g. electoral rules, courts of law, etc.) which might confound the interpretation of results from cross-country studies. Moreover, India's federal structure offers rich variation in the spatial allocation of public goods and in the electoral competitiveness at the local level which allows us to detect the effect of political competition on healthcare provision. Our work is also timely: the novel coronavirus pandemic has clearly shown how vulnerable India's health system is to any sizeable health shock.[2] Against this backdrop, we ask: What explains the poor provision of public healthcare in India? How can incumbents get away with neglecting healthcare despite almost seventy-five years of nearly continuous democratic rule? To what extent does electoral competition matter?

We contend that more visible public goods create electoral incentives (for incumbents) that are distinct from less visible public goods. As a result, despite its incontrovertible public benefits, public goods that are less visible remain under-provided.[3] But,

[2]Official estimates of coronavirus-related deaths in India surpassed 414,000 by end-June 2021 with researchers estimating excess deaths to be an order of magnitude higher at 3.4-4.9 million (Anand et al., 2021).

[3]In this study, we consider a public good to be more visible if information about its provision is widely dispersed among the voters whereas, it is less visible if information is concentrated to a few. According to this view, physical structures such as health centres are highly visible – they are easy to observe and information about its provision flows freely. By contrast, only a fraction of the voters seek primary medical care at public health centres which means that information related to the availability of

what makes 'visibility' (of public goods) salient? It might be helpful to think about visibility of a public good as an information cue that voters avail to infer incumbent's competence when voters cannot observe competence directly. As Downs (1957) notes, when information is too costly to obtain or requires substantive cognitive deliberation, voters choose to remain rationally ignorant and rely on information shortcuts. Moreover, it is the least politically aware that rely most heavily on such cues (Mondak, 1993; Bowler and Nicholson, 2018). Furthermore, recent research on the psychology of decision-making shows that people facing scarcity are more susceptible to judgemental errors because their bandwidth to process information is already low due to monetary concerns, malnutrition etc. (eg. Schilbach et al., 2016; Shah et al., 2015; Mullainathan and Shafir, 2013; Huijsmans et al., 2019). The presence of high information frictions in healthcare (eg. Arrow, 1963; Das et al., 2016), especially relating to facility-level capacities, place a high cognitive load on voters in inferring incumbent's ability which induces them to rely on information cues. As a result, voters are likely to reward politicians that provide highly visible health centres but discount the provision of less visible public goods such as doctors or supplies at health facilities. The incumbents are aware of the voters' strategy. Therefore, it is rational for incumbents to focus on highly visible health centres which are more electorally rewarding rather than less visible but equally important complements that yield low electoral returns.

We present evidence that, consistent with theory (e.g. Mani and Mukand, 2007; Rogoff, 1990, etc.), political competition induces incumbents to focus on health centres that are more visible. By contrast, political competition has no measurable impact on the availability of medical personnel or other less visible items within health centres. The same pattern is clearly visible when we tabulate our data: For example, whereas highly visible indicators of healthcare access such as health sub-centres and primary health centres grew by 19.5% and 11.3%, respectively between waves 3 and 4, some of the indicators of health centre capacity, which are less visible, witnessed a decline during the same period. The decline was particularly conspicuous for medical personnel – female health workers at health sub-centres and doctors at primary health centres. In addition, we provide suggestive evidence that focusing on highly visible public goods increases the re-election prospects of the incumbent party at the district-level[4] whereas, the effect is muted for less visible public goods. But is this costly for voters? We find that political competition has no discernible impact on key measures of health outcomes which are of primary interest to voters (see section 5.3). Thus, the results

doctors or supplies *within* health centres are concentrated among a minority, although the components by themselves might be important. In addition, studies show that in rural India where there is a paucity of doctors, the quality of primary medical care offered by medical assistants (or non-physician clinicians) are no different than qualified doctors (Rao et al., 2013b,a). And, this is in line with other studies which show that formal medical qualification is a poor predictor of the quality of primary healthcare in India (Das et al., 2016, 2020). Together, these reduce the 'visibility' of trained doctors to those seeking primary healthcare (which is the focus of this study).

[4]In India's decentralized administrative structure, districts are nested with states and the states come together as a union.

highlight a discord between incumbent's incentive to provide more visible public goods and better healthcare outcomes which indicates that resources are being misallocated in healthcare delivery.

Given the centrality of healthcare in boosting human capital (eg. Weil, 2014), it is important to understand the political economic factors that affect its provision. Moreover, healthcare has seen a revival of interest amongst leading political parties (Chatterjee, 2019). For instance, figure 1 shows that the share of government health expenditure to the total current health expenditure (CHE) has increased at a CAGR of 1.3% between 2000 and 2015, while the share of out-of-pocket spending (OOPS) has recorded a decline at a CAGR of −0.64% during the same period.

[Figure 1 about here.]

The majority of the literature on healthcare provision focuses on the political economic factors that affect healthcare access implicitly assuming that health centre capacity i.e. doctors, nurses and other essential capacity/ supplies, closely follows access. But, as our data indicates and which we discuss in section 3.3, this is certainly not the case in India. Hence, viewing healthcare as a homogeneous good will be misleading. In this study, we fill this knowledge gap by considering the differential impact of political competition on healthcare access and on health centre capacity such as doctors, medical supplies, etc..

To examine the effect of political competition, measured as the effective number of parties by vote share, we combine electoral data with granular data on healthcare provision from three recent rounds of the Indian District Level Household Survey (DLHS) administered in 2002, 2007 and 2013, respectively. The main challenge in estimating the relationship between political competition and healthcare provision, however, is that political competition is likely to be endogenous. This might be due to omitted variables such as local institutional quality or the effectiveness of the bureaucracy which affect the relationship between political competition and public healthcare. Reverse feedback is another concern which might affect our estimates. Under such circumstances, least squares estimates would be biased and inconsistent.

We overcome the inference problem by using an instrumental variable strategy where we instrument political competition with the *electoral rank of turncoats* to capture the switch in the share of voters supporting turncoats which generates variation in the degree of political competition at the local level as we discuss below. Our identification strategy is somewhat similar to Mitra and Mitra (2017) who use the vote share of the Congress party as an instrument for political competition by exploiting the shift in the voter support for the Congress party. In this study, we use the electoral rank of turncoats i.e. the electoral rank of candidates who switch their political allegiance in the current election relative to the previous election round, as our instrument.[5]

[5]It is worth noting that the share of turncoats in Indian elections is non-trivial and is around 5% of the total candidates contesting a seat, on average. This is comparable to the share of female candidates which is about 7% of the total candidates contesting a seat

An electoral rank closer to one for the turncoats implies a shift toward mechanical voting i.e. people voting for the individual along identity lines such as caste, religion, ethnicity etc. (e.g. Wantchekon, 2003; Adida et al., 2017, etc.). This creates barriers to entry into politics which therefore decreases political competition. On the other hand, an electoral rank for the turncoats that is further away from one implies a shift in the opposite direction and a move toward policy-based voting instead of mechanical voting which encourages entry into politics and therefore increases political competition.[6]

Besides accounting for endogeneity, in all our regressions we include district and survey-wave fixed effects to absorb time-invariant unobservables and control for time-varying factors such as voter turnout, the percentage of seats reserved for the scheduled castes, the percentage of female candidates, and the interaction of key socio-economic variables with survey-waves to pick up differential impacts by time trend. Furthermore, we provide evidence that the instrument is unrelated to different political and economic characteristics at the district level. However, it might still be possible that the instrument is endogenous in the same way as political competition. To alleviate this concern, we test the sensitivity of our instrumental variable estimate to the instrument itself being potentially endogenous following the approach by Nevo and Rosen (2012) which confirms the robustness of our result. We discuss the empirical strategy in section 4 and the validity of the instrument in section 5.2.

To preview our main result, we find that after controlling for endogeneity, a one standard deviation (SD) increase in political competition, measured as ENP, raises the probability that a village has a health facility by 8%-15% across different facility-types.[7] Regarding health-centre capacity, we find that although political competition affects the provision of inexpensive supplies at the facility-level such as blood pressure monitors and stethoscopes, it does not hold up to closer scrutiny and becomes insignificant when we use the margin of victory as an alternative definition of political competition (see section 6). Moreover, the effect of political competition is entirely muted for variables at the primary health-centres including the availability of doctors. These results are robust to using an alternative measure of political competition based on the margin of victory, controlling for the incidence of turncoats to capture intrinsic differences across districts in their support for turncoats, to a falsification test using a one-period lead of political competition (i.e. political competition in the next, but not yet realised, election) which ensures that post-election effect is not driving our results, and to re-estimating the regression model at the district level (see section 6).

[6] In section 5.2, we discuss that our instrumentation strategy is robust to concerns relating to the potential endogeneity of the instrument i.e. of electoral rank of turncoats being endogenous in the same way as political competition. We show that the instrument cannot be predicted by observable district characteristics. We also control for the incidence of turncoats at the district level in section 6 to ensure that district-specific factors such as stronger ethnic ties do not affect our estimates.

[7] A one standard deviation increase in political competition measured as ENP is a 0.69 units increase (see Table 2). We multiply this value with the respective coefficients on political competition in Panel A, Table 3 times 100 to get the percentage change in the outcome variable due to a one SD increase in political competition.

But what might explain the selective effects of political competition on public provision? To this end, we provide suggestive evidence that focusing on highly visible public goods raises the re-election prospects for the incumbent party which presents a clear motive that helps to ground our findings. Moreover, to ensure that our results are driven by a political economic mechanism which is consistent with theory, we examine the effect of election-year cycles and the role of political alignment in public provision. The results from these checks increases the confidence in our results. We find evidence of election-year political manipulation in small-budget consumption items that are easy to procure and provide such as blood pressure monitors, stethoscopes, examination table, etc. Interestingly, we find election-year effects in the availability of doctors who can be fired if support is not forthcoming.[8] Regarding political alignment, we find larger public provision in districts that are aligned with the majority party at the state level and these effects are concentrated on public goods that require greater vertical coordination such as health centres. These results provide compelling evidence of a political economic mechanism at work. Importantly, the relationship between political competition and healthcare provision is robust to separately including the effects of election-year cycles and political alignment.

Our work contributes to interdisciplinary research on the political economics of public provision. Primarily it relates to the role of electoral competition on public provision (e.g. Banerjee and Somanathan, 2007; Besley et al., 2010; Chhibber et al., 2004; Crost and Kambhampati, 2010; Saez and Sinha, 2010; Arvate, 2013). Using granular data on healthcare access and capacity in India, we offer new empirical evidence on the role of political competition in affecting healthcare provision. Given that politicians are responsible for providing a vector of public goods with a limited budget, we find evidence of a trade-off in allocating resources which is novel in the empirical literature. And, although we focus on India, the insights from this study are relevant to policymakers in other developing countries with similar institutional structures. In this sense, our work relates broadly to studies on how democracies affect public provision such as healthcare (e.g. Besley and Kudamatsu, 2006; Wang et al., 2019) and education (e.g. Stasavage, 2005; Harding and Stasavage, 2014), among many others.

Moreover, we contribute to the literature on the role of incentives facing politicians (or political parties) on public provision (Barro, 1973; Ferejohn, 1986; Fearon, 1999;

[8]This result together with the null effect of political competition on the provision of medical personnel discussed above indicate that medical personnel play a dual role in healthcare provision: On the one hand, they are an input in healthcare delivery and incumbents allocate resources to medical personnel among a vector of alternatives to maximize electoral gains. On the other hand, medical personnel are themselves a voter group and increasing their hiring, especially during election-years, might be a way to cultivate their support and convert loyalties to votes. In fact, this result resonates with findings in Fagernäs and Pelkonen (2020) who show that teacher transfers in India follow the electoral cycle. Thus, our result indicating the presence of electoral cycle in the provision of medical personnel should be interpreted as capturing the incumbent's strategic motive to persuade doctors to vote for them rather than as incumbents making investments in a broad-based public good which caters to all voters.

Besley, 2006). We show that it is electorally rewarding for incumbents to focus on more visible public goods which affects the size and composition of the policy mix (Mani and Mukand, 2007; Rogoff, 1990). The distortion is even more salient in healthcare where information frictions are high.

We also contribute to the literature on electoral cycles (e.g. Nordhaus, 1975; Tufte, 1975; Rogoff, 1990; Rogoff and Sibert, 1988, among others) and provide evidence of election-year manipulation in consumption spending and particularly in the availability of doctors. Furthermore, our work relates to the political alignment literature (e.g. Khemani, 2003; Arulampalam et al., 2009; Solé-Ollé and Sorribas-Navarro, 2008) where we show that political alignment of districts with the majority party at the state level improves public provision, especially for public goods that require greater vertical coordination effort.

We organize the rest of the paper as follows: Section 2 discusses the literature on the relationship between political competition and public provision. Section 3 provides the necessary background, introduces the dataset, and describes how we construct our measure of political competition. Section 4 discusses our identification and empirical strategy. Section 5 presents the main regression results, discusses the validity of the instrument and provides additional evidence on the political economic mechanism at work. Section 6 presents robustness checks. Section 7 concludes.

2 Related Literature

A primary reason for incumbents to respond to voters' demand is because they enjoy the rents from being in office.[9] As Besley (2006) notes, a "cast iron law of politics is that politicians like to be re-elected" (pp. 104). Therefore, rational incumbents will allocate limited resources amongst a vector of public goods to maximize their re-election prospects. And, focusing on highly visible public goods that gather more votes might be a winning electoral strategy.

Political Competition and Accountability: The literature suggests a robust correlation between democracy and public goods provision (Baum and Lake, 2003; Besley and Kudamatsu, 2006; Lake and Baum, 2001; Stasavage, 2005; Harding and Stasavage, 2014). A widely accepted view is that voters use elections as mechanisms of political accountability by re-electing incumbents who provide more public goods (which increases material well-being) while sanctioning those who don't (Barro, 1973; Ferejohn, 1986). Thus, accountability or the credible threat of being voted out-of-office induces incumbents to be responsive to voters' demand which is absent in autocracies. Another related view is that elections allow voters to weed out incompetent politicians (Fearon, 1999; Osborne and Slivinski, 1996; Besley and Coate, 1997; Besley, 2005). And, political

[9] These rents could take the form of 'ego' rents i.e. the status and power of holding office (Rogoff, 1990), material gain by way of opportunities for graft or perks from office, or public goods concern from having strong preferences for a particular policy.

competition, by attracting scrutiny of incumbent's performance, selects more competent candidates and keeps them in check once they are elected (eg. Aidt, 2003; Arvate, 2013; Besley and Kudamatsu, 2006; Gottlieb and Kosec, 2019).

But whether political competition unambiguously improves public provision is debated. One strand of the literature argues that political competition increases efficiency by reducing the deadweight loss associated with redistribution (Becker, 1983, 1985; Wittman, 1989). In contrast, another strand argues that political competition induces incumbents to divert resources away from productive purposes into wasteful rent-seeking activities (Buchanan and Wagner, 1977; Tullock, 1967). The empirical evidence on this is equally ambiguous: Research shows that political competition encourages lower tax revenues, higher infrastructure spending and the presence of right-to-work laws in the US (Besley et al., 2010). It is associated with an increase in school enrolment, the number of teachers in elementary schools, and free immunizations in Brazilian municipalities (Arvate, 2013), but a reduction in public provision in Mali (Gottlieb and Kosec, 2019) and a smaller government size in Latin American countries (Aidt and Eterovic, 2011). However, the effect of electoral competition on public provision is found to be non-linear in Russia (Nye and Vasilyeva, 2015) and insignificant in Mexican municipalities (Cleary, 2007).

Studies focusing on India reach a conclusion that is equally mixed. Political competition varies widely across its sub-national units (Keefer and Khemani, 2005). Saez and Sinha (2010) find strong and persistent evidence of the effect of party competition on public expenditure choices in Indian states. Chhibber and Nooruddin (2004) find that states with a two-party system in India provide more public goods than states with multi-party systems. In addition, political competition is associated with higher levels of human development (Dash and Mukherjee, 2015), more food-grain distribution during natural calamities (Besley and Burgess, 2002) and greater provision of electricity (Baskaran et al., 2015), while others find no systematic association between political competition and public goods provision (Banerjee and Somanathan, 2007; Crost and Kambhampati, 2010).

The widely varying insights from past studies suggest that the relationship between political competition and public provision might be influenced by the institutional context and the specific features of the public goods themselves. For instance, political market imperfections such as high information barriers or fractionalized voters might distort the functioning of democracy (Keefer and Khemani, 2005; Gottlieb and Kosec, 2019). The high information frictions in healthcare imply that its public provision is likely to be distorted. Another important factor which mediates the relationship between political competition and public provision is the visibility of public goods. We discuss this next.

Visibility of Public Goods: As mentioned above, elections provide a mechanism for voters to hold incumbents accountable by re-electing competent ones while voting

those who shirk out-of-office. A key input in the re-election decision of voters is the visibility of the public good (Rogoff, 1990; Mani and Mukand, 2007; Harding, 2015). There are two reasons why visibility matters: First, voters rely on observable signals (or information cues) to infer incumbent's competence since they cannot observe competence directly. The more precise the signal, the more confident the voter is about the incumbent's *ability* to provide public goods whereas, noisy signals are less informative. Thus, under incomplete information, voters infer competence based on the signals they receive which then feeds into their re-election decisions. Highly visible public goods such as health centres strongly project incumbent's ability and voters can observe them easily. In comparison, the capacity variables within health facilities are less visible and therefore less informative about the incumbent's competence.

Secondly, politicians are responsible for allocating limited resources amongst different kinds of public goods. Likewise, voters receive a myriad of signals to infer incumbent's ability. Not only does this make it harder for voters to attribute specific public goods to incumbent effort but it also places a high cognitive load on the voters. Recent research in the psychology of decision-making shows that people are much more likely to make judgemental errors when their decision-making bandwidth is constrained by scarcity – of money, nourishment etc. (eg. Schilbach et al., 2016; Shah et al., 2015; Mullainathan and Shafir, 2013; Huijsmans et al., 2019). This implies that voters who are poor i.e. those who are most likely to seek public healthcare, are also the ones to make biased and inaccurate decisions in evaluating incumbent's competence which affects their re-election decisions.

From the above discussion, competitive elections in conjunction with the incumbent's desire to get re-elected generate two strong predictions: (a) political manipulation in public provision as elections near; and, (b) a positive alignment effect in public provision i.e. public provision would be higher in districts that are politically aligned with the majority party at the state level.[10]

For the first, incumbents have an incentive to raise public spending to signal their competence as elections near in order to increase their re-election prospects (Nordhaus, 1975; Tufte, 1975; Healy and Lenz, 2014). This is because voters weight more heavily the recent past than the distant past in informing their re-election decisions. The stronger the projection of such signals, the more favourable the voters are toward re-electing the incumbent (Franzese Jr, 2002; Lewis-Beck and Paldam, 2000). Moreover, such election-year manipulations are biased toward consumption spending or transfers with 'high immediate visibility' which yield greater electoral returns (Tufte, 1975; Rogoff and Sibert, 1988; Rogoff, 1990).[11]

[10] Here. we focus on political alignment with states because healthcare is the main responsibility of the states which we discuss in section 3.

[11] Rogoff and Sibert (1988) and Rogoff (1990) reconcile pre-election expansion in public spending with voter rationality by suggesting that the observed pre-election expenditure acts as a signal of the incumbent's competence to provide more public goods. In these models, politicians have private information about their competence which voters do not. Instead, voters infer incumbent's competence

Secondly, public provision requires both horizontal coordination (e.g. lateral cooperation among local civic authorities) and vertical coordination (e.g. ministerial funding approval). The latter is likely to be particularly important for sizeable investment projects such as health centres. Alignment of lower level jurisdictions (i.e. the districts) with the majority party at the state level reduces the chances of legislative deadlock and encourages co-operation across the tiers which increases public goods provision.[12]

3 Background and Data

In this section, we outline the institutional features of Indian elections, introduce our data and discuss the construction of our measure of political competition.

3.1 Political Institution

In this study, we focus on state legislative assembly elections. These elections are typically held once every five years and are staggered across groups of states. The candidate securing the maximum votes in her constituency is declared the winner and is elected to the state's legislative assembly to represent her constituents' demands.[13] Once legislators table these demands in the respective state's legislative assemblies, they are discussed and debated on the assembly floor and the ministers (who are themselves legislators) direct the appropriate authorities to take action. In case of healthcare, it would be the state's health minister who would coordinate action among different departments and bureaucrats to address the legislator's concerns. This implies two things: first, legislators have significant capacity to lobby their constituents' interests in the state legislature and secondly, partisan alignment of districts with the state's majority party is likely to affect public provision as discussed in section 2.

In addition, legislators have access to local area development (LAD) funds which are earmarked by state governments for development work in the legislator's constituency. Although the size of these funds vary across states,[14] legislators can recommend how the funds are to be allocated across different development works. This allows legislators

by observing the amount of public spending – the signal. Recent work has concentrated on electoral cycles in employment in the Philippines (Labonne, 2016), targeted expenditure in Colombia (Drazen and Eslava, 2010) etc. In the Indian context, studies have focused on the election-year targeting of special interest groups (Khemani, 2004), targeted provision of agricultural credit by government-owned banks (Cole, 2009), in hiring and transfer of teachers (Fagernäs and Pelkonen, 2020), electricity and line losses (Baskaran et al., 2015; Min and Golden, 2014) and investment in a range of public goods provision (Saez and Sinha, 2010).

[12]Past work suggests that in decentralized democracies, partisan alignment of the lower level jurisdiction with the higher level often leads to 'tactical' rather than 'programmatic' transfers that favour project implementation in politically aligned regions (Solé-Ollé, 2013; Solé-Ollé and Sorribas-Navarro, 2008; Arulampalam et al., 2009; Khemani, 2003).

[13]Electoral constituencies are nested within administrative districts. And, on average, a district consists of around 10 electoral constituencies.

[14]For example, in Rajasthan Rs. 3 crores are allocated per legislator whereas, it is Rs. 60 lakh per legislator in West Bengal.

the scope to manipulate funds toward more visible projects and time them to coincide with assembly elections to increase their chances of re-election.

3.2 Public Health System

In this section, we begin by discussing the centre-state financing of health and outline important parameters that relate to the different components of India's public health network.

Financing of Public Health: India's decentralized administrative structure consists of the centre, the states, and the local bodies – the village panchayats and urban municipalities. The Seventh Schedule of India's Constitution demarcates the responsibilities between the centre and the states. While public health and sanitation, hospitals and dispensaries fall under the state's purview, medical education, medical professionals, population and family control are under the joint responsibility of the centre and the states with the former having overriding powers. Primary healthcare, which comprises the health sub-centres (HSC) and primary health centres (PHC), is the main focus of this study and is the responsibility of the state governments. While the state governments are mainly responsible for health service delivery, the financing of public healthcare is shared between the centre and the states in the 60:40 ratio. Hence, local political economic factors are likely to play an important role in its spatial allocation (see section 3.2). However, in spite of the fiscal arrangement, states differ widely in their per capita health spending which gets reflected in their respective health outcomes.

Consider two Indian states: Kerala in the south and Bihar in the east. The per capita public health spending in Kerala in 2004-05 was Rs. 287, more than three times that in Bihar. In terms of health outcomes, the life-expectancy in Kerala, a widely used proxy for health, was 73.5 years whereas, it was 8.3 years shorter in Bihar (see Table 2 in Shiva Kumar et al. (2011)).

To address the inequality in health outcomes, the centre's share of expenditure on health under the National Rural Health Mission (NRHM) was increased to 85% of NRHM allocation in socio-economically backward states.[15] However, a sizeable portion of the NRHM budget, especially in states with poorer health outcomes like Bihar and Madhya Pradesh, remains underutilized which suggests that political failure rather than budget-constraints underlie poor health outcomes (Berman et al., 2017).

[Table 1 about here.]

Health System Hierarchy, Coverage and Operating Cost: India's public healthcare system comprises of a network of health facilities at the primary, secondary, and tertiary levels, each specialising in a defined set of functions. In this study, we focus on the primary healthcare network.

[15] These include eight states namely Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttarakhand and Uttar Pradesh. They are also referred to as Empowered Action Group (EAG) states.

The first point of contact for individuals in rural areas are the health sub-centres (HSC), which focus on outreach activities and provide basic healthcare services – first aid, prenatal and postnatal care, malaria treatment but not antibiotics – and manned by healthcare workers. Primary health centres (PHC) are next in the hierarchy and focus on preventive, promotive, curative, and rehabilitative care. This is, in fact, the first level at which one can consult a doctor. Finally, community health centres (CHC) and hospitals provide specialised care and are staffed with surgeons, physicians, gynaecologists/ obstetricians, paediatricians and supported by paramedical personnel.

Table 1 provides information on coverage and approximate operating costs for HSCs, PHCs and CHCs, respectively. It is clear from the table that actual healthcare coverage falls short of the norm across the board. For incumbents intent on maximising votes per rupee spent the cost of delivering healthcare is an important parameter to consider. This is because, for a given budget constraint, incumbents face a trade-off between providing more-visible low-cost services and less-visible high-cost services.[16] We now turn to discussing data and measurement.

3.3 Data and Measurement

Our analysis combines data from multiple sources. We obtain data on healthcare access and the capacity of health-centres from the District Level Household Survey (DLHS) which we combine with data on state legislative assembly election results from the Election Commission of India. We discuss our data and measurement of political competition below.

Healthcare Data: We obtained data on healthcare from three consecutive waves of the District Level Household Survey (DLHS) – wave 2 (2002-03), wave 3 (2007-08) and wave 4 (2013-14). DLHS is a nationally representative survey conducted by the Indian Ministry of Health and Family Welfare (MoHFW) along with the International Institute for Population Sciences (IIPS). In this study, we focus on 15 major Indian states.[17] Our measure of healthcare access draws on information from around 11,000 villages, on average, across the three survey waves, sampled to be representative of the population. We compute our measures of health centre capacity based on roughly 15,000 health sub-centres and 7,600 primary health centres. In total, our data covers about 1,100 district-waves which we analyse.

[16] In a study covering three northern states, Prinja et al. (2014, 2016) find that the annual operating cost per HSC was about 1.03 million rupees, 8.8 million rupees per PHC, and 26.9 million rupees per CHC. Thus, the more specialised the facility the more costly it is to deliver care.

[17] The 15 states included in this study are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. We excluded the north-eastern states, the state of Jammu and Kashmir and the union territories due to the direct intervention of the central government in their day to day administration. We drop the newly constructed states of Jharkhand, Chhattisgarh, and Uttarakhand, that were carved out in 2000 to maintain consistency.

The DLHS village module provides information on whether a village had access to different kinds of health facilities.[18] Figure 2 presents information on healthcare access by different survey waves. We observe that healthcare access generally increased over time. However, there were significant disparities to begin with. For example, about 42% of villages within a district in waves 2 and 3 had access to HSCs which increased to 61% in wave 4. For the higher level health facilities, however, the figures were much lower. Across the three waves that we consider in this study, only around 16.8% of the villages had access to PHCs, 6.1% to CHCs and 5.9% to government hospitals. Thus, it is inevitable that villages with poor access to healthcare are likely to suffer the most from any present or future health crises.

[Figure 2 about here.]

To capture the capacity of health facilities to deliver care, we consider variables that relate to healthcare personnel, basic medical equipment, and the condition of physical infrastructure. We selected the variables based on two factors: first, they had to be available for at least two consecutive waves of the DLHS survey; and, second, they had to be roughly comparable across the health system hierarchy. For example, we capture the human resource dimension of health-centre capacity by the presence of female healthcare workers in HSCs and by the presence of doctors in PHCs. Other variables that capture the capacity of health facilities include the condition of buildings and the availability of basic medical infrastructure such as blood pressure monitors and examination table in HSCs, or an operating table in the case of PHCs.

Figures 3 and 4 plot the capacity indicators for HSCs and PHCs, respectively, by different survey waves. The figures show that, facility-level capacity has generally improved over time, although not to the same extent as healthcare access. We observe that between waves 3 and 4, an additional 6.8% of health centres had a blood pressure monitor taking the total to about 83.7% of HSCs. For the same period, an additional 8.7% of HSCs surveyed reported having an examination table while the improvement was higher at 15.8% for stethoscopes. In contrast, 5.1% fewer HSCs reported having a female health worker. The picture is somewhat similar regarding PHC capacity: Between waves 3 and 4, about 4.5% fewer PHCs reported having a female doctors while the decline was 5.4% for doctors overall. Moreover, 2.1% fewer PHCs reported having an operating table while an additional 24.7% PHCs reported building condition as good or satisfactory. These observations are in line with evidence presented elsewhere regarding the large-scale shortfall of doctors and nurses.[19] In fact, the Comptroller and Auditor General of India (CAG) in a recent report has pointed out the appalling state of medical care in Bihar and Uttar Pradesh (see here). Predictably, these states have

[18] DLHS-4 village module was not administered in the states of Rajasthan, Uttar Pradesh, Bihar, Assam, Odisha, Madhya Pradesh, and Andhra Pradesh. Hence, the variables relating to access in DLHS-4 were drawn from the 8 remaining states. This, however, did not affect the facility module in DLHS-4 from which we draw the indicators of health-centre capacity.

[19] See, for example, [1], [2], [3], or [4], among others.

been severely affected by a shortage of doctors and hospital beds during the pandemic (see, for example, here or here).

[Figure 3 about here.]

Finally, to get an overall picture, we construct three indices: an index for healthcare access, one for HSC capacity and another for PHC capacity. To construct these indices, we use the components of access, HSC capacity and PHC capacity, as discussed above, and reduce the information to a single dimension using the method of Principal Components Analysis (PCA) in each case.

[Figure 4 about here.]

Figures 2, 3 and 4 above show that although the respective indices have generally improved across the waves, the rate of change for each of its components varies considerably. For instance, while more visible indicators of healthcare access notably HSCs and PHCs grew by 19.5% and 11.3%, respectively between waves 3 and 4, some of the indicators of health centre capacity actually declined during the same period, especially medical personnel such as female healthcare workers at HSCs and doctors in PHCs.

Electoral Data: To construct our measure of political competition we obtained legislative assembly election results at the constituency level from the Election Commission of India (ECI). We then matched individual constituencies to their respective districts using the census year 2001 administrative divisions as a benchmark. The matching process was non-trivial as states and districts were reorganized during the period under study. During the matching process, however, new districts that were carved out of more than one district had to be dropped from the analysis. In the matched electoral data, a district nests ten electoral constituencies on average. We then use this data to construct a measure of political competition.

In this study, we consider the effective number of parties (ENP) by vote share as our primary measure of political competition (Laakso and Taagepera, 1979). We compute this as:

$$ENP = \frac{1}{\sum_{j=1}^{N} s_j^2} \tag{1}$$

where s_j is the vote share of the j^{th} political party in an assembly constituency and N is the number of parties contesting the assembly seat.

From equation (1), ENP increases as the number of parties contesting the seat grows and as the disparity in the vote share of those parties widens. Taken to its extremes, ENP will equal N – the actual number of parties contesting the seat – if all parties contesting the seat get an equal number of votes. But, if one party gets a huge majority, ENP will be slightly larger than one. Thus, larger values of ENP indicate that political competition is high whereas, smaller values of ENP indicate that political competition is low.

A critical reader might be concerned that a proliferation of parties might *reduce* political competition due to legislative deadlock (see, for example, Dash et al., 2019, for this line of argument). To ensure that this is not affecting our analysis, we test the robustness of our result to using an alternative definition of political competition based on the margin of victory between the winner and the runner-up and find qualitatively similar results (see section 6).

There are three reasons why we select ENP as our primary measure of political competition. First, ENP captures the uncertainty in getting elected. When ENP is large there is greater uncertainty about who might win the seat which forces incumbents to perform (Saez and Sinha, 2010). Secondly, ENP, as a measure of political competition, is compatible with India's first-past-the-post (or winner takes-all) multi-party electoral system. Recent studies show that while the margin of victory is crucial to electoral competition in proportional electoral systems, it is 'irrelevant' in a winner takes-all electoral system (Lizzeri and Persico, 2001, 2005). Finally, ENP captures the extent of political entry barriers i.e. the degree of inclusivity in the electoral race. In other words, low ENP would imply high political entry barriers whereas, high ENP would mean that political entry barriers are low and groups could freely enter the political arena.

ENP or its variant $(1 - HHI)$, a definition based on the Hirschman-Herfindahl Index (HHI), has been widely used in the literature to measure political competition. For example, Saez and Sinha (2010) find that competition, measured by ENP, raises investment in education in India. However, in Mali, using the change in ENP between two survey years to measure political composition, Gottlieb and Kosec (2019) find that it is negatively associated with public provision. Using $(1 - HHI)$ to measure political competition, Datta (2019) finds that political competition reduces infant mortality in Indian states,[20] while Kosec et al. (2018) find that, in Pakistan, political competition is positively associated with more publicly-provided infrastructure and amenities.

DLHS data provides district identifiers consistently over the three survey waves. Therefore, we aggregate ENP at the district-level by averaging its value across all the constituencies nested within a district. Table 2 shows that, on average, ENP was three in our sample (i.e. there were effectively three parties contesting a seat once we account for their respective vote shares) with a standard deviation of 0.69.

[Table 2 about here.]

Socio-economic data: We obtain district-level socio-economic data from census 2001. Specifically, we consider logged population, logged urban population and literacy rate to control for differences across districts along these characteristics. Table 2 shows that around one in six seats were reserved for the scheduled castes – the backward sections of society – while 7% of the contestants were female.

[20] Using disaggregated data at the district level we do not find any measurable impact of political competition on new born deaths and infant heaths reported at HSCs and CHCs (see Table 10 in the appendix.)

In the next section, we discuss our identification and empirical strategy.

4 Identification and Empirical Strategy

4.1 Identification

Our main aim in this paper is to investigate the effect of political competition on healthcare provision. However, as mentioned above, political competition is likely to be endogenous. Omitted variables such as differences in local institutional quality or bureaucratic effectiveness might affect the relationship. Under such circumstances, a least squares estimator will yield biased and inconsistent estimates. The estimates will be downward biased if healthcare provision is negatively correlated with the omitted variables while it will be upward biased if the correlation is positive.

We control for endogeneity by using an instrumental variable strategy where we instrument political competition, measured as ENP, with the electoral rank of turncoats contesting a seat (i.e. the electoral rank of candidates who switch their political allegiance). In electoral systems which allow personal votes such as the first-past-the-post system in India, parties may become less relevant which creates incentives for opportunistic individuals to switch sides (Tavits, 2009; Fraenkel, 2012).[21] A switch in the share of voters supporting turncoats generates variation in electoral competition which we exploit. An electoral rank closer to one for the turncoats indicates a shift toward mechanical voting where voters support the individual along identity lines such as caste, religion, ethnicity, etc. This creates barriers to entry into politics which therefore decreases political competition. On the other hand, when voters reject turncoats, it indicates a shift away from mechanical voting which lowers entry barriers into politics and hence increases political competition. As mentioned earlier, our instrumentation strategy is somewhat similar to the one used in Mitra and Mitra (2017) who instrument political competition with the vote share of the Congress party to capture the shift in political support. Moreover, as we discuss in section 5.2, our estimates are robust to potential concerns regarding the endogeneity of the instrument itself and therefore reliable.

To operationalise this, we construct the instrumental variable using data from *Lokniti* which tracks the career progression of contestants in Indian elections (see Jensenius and Verniers, 2017, for a discussion of the dataset). We merge this with our electoral data and estimate the model on this combined dataset. Figure 5 plots the electoral rank of turncoats on the left axis and the share of turncoats as a percentage of total candidates contesting a seat on the right axis by election-year. From the figure, we observe significant swings in political fortunes of turncoats over the years: while

[21] There is ample anecdotal evidence of unprincipled and 'brazen shift in political loyalties' in Indian elections lured by ministerial positions or monetary incentives. See for example, [1], [2], or more recently [3].

they were quite successful in the 1999 elections securing a little above the second rank, they were much less so in 2009 when a turncoat obtained a fourth rank, on average. The tide turned once again in more recent elections with turncoats averaging between second and third ranks. With regard to the share of turncoats as a percentage of the total contestants, we observe that it was highest during the 2000 elections at 9.6%, and has oscillated between 2%-5% since then, except for a spike during the 2005 elections. Overall, about 5% of the candidates in our sample were turncoats.

[Figure 5 about here.]

The shift in voter support captured by the electoral rank of turncoats (the instrument) has a direct effect on political competition (the endogenous variable). Figure 6 plots the the rank of turncoats pooled across all the districts over the three waves in our sample on the horizontal axis and political competition measured by ENP, on the vertical axis aggregated in a similar way. As mentioned earlier, we average the electoral variables at the district-level because healthcare data provides only district identifiers consistently for the three survey-waves that we consider. A rank closer to one implies that turncoats were electorally successful whereas, they were less so when they obtained a rank further away from one. The positive gradient shows that, on average, political competition as measured by ENP increases as turncoats meet with less electoral success which is consistent with lower entry barriers encouraging political competition.

[Figure 6 about here.]

4.2 Empirical Strategy

We use the two-stage least squares (2SLS) method to estimate the effect of political competition on healthcare provision.

As a first step, we obtain the predicted values of political competition, denoted as $\widehat{PC}_{d,t-1}$, from the following first-stage equation:

$$PC_{d,t-1} = RT_{d,t-1} + \zeta X_{d,t-1} + \eta_t + \kappa_d + \varepsilon_{dt} \tag{2}$$

where $RT_{d,t-1}$ is the rank of turncoats in an electoral race aggregated at the district level. A turncoat wins the electoral race if she secures the first rank, is a runner-up if she secure the second rank, and so forth. In our sample, a turncoat ranks a little higher than third in an electoral race, on average. $PC_{d,t-1}$ denotes district-level political competition measured by ENP for the election prior to the survey-year as denoted by the subscript $d, t-1$. In equation (2), we are interested in the relationship between the electoral rank that a turncoat obtains and political competition at the district level. $X_{d,t-1}$ is a vector of time-varying political controls that includes voter turnout, the percentage of seats reserved for the scheduled castes, the percentage of female

contestants as well as survey-wave interacted socio-demographic variables – logged population, logged urban population, and literacy from the census year 2001 – at the district-level. Further, we include district fixed effects, κ_d, and wave fixed effects, η_t, to control for time-invariant district-specific unobservables and wave-specific shocks, respectively. ε_{dt} is an error term clustered at the district-year level.

We then substitute the predicted values obtained in eq.(2) above, in the following second-stage regression:

$$h^k_{idt} = \gamma \widehat{PC}_{d,t-1} + \delta\, X_{d,t-1} + \psi_t + \alpha_d + u_{dt} \tag{3}$$

where h^k_{idt} denotes the k^{th} variable relating to health access or capacity as the case may be. i indexes a village for variables relating to healthcare access while it indexes a health facility for capacity variables. The villages and health facilities are nested within district d and observed during wave t of the DLHS survey. However, as already mentioned, DLHS only provides district identifiers consistently across the three survey waves that we consider. Therefore, we use the subscript d in equations (2) and (3). The coefficient on political competition, γ, is of primary interest. $X_{d,t-1}$ is as defined in eq.(2) above. α_d and ψ_t denote district and survey-wave fixed effects respectively, while u_{dt} is the error term clustered at the district-year level.

In our estimation, we consider elections prior to the survey-year to reduce potential bias arising from reverse causality. Due to the staggered nature of elections in India, where they are held across groups of states, the electoral variables used in the regression pre-date the health variables by about three years, on average. In addition, to ensure that outliers are not driving our results we winsorize the top 1% and the bottom 1% of PC and RT, respectively, in all our regressions.

A positive coefficient on political competition i.e. $\gamma > 0$ in eq.(3), means that incumbents respond to political competition by increasing the provision of the particular healthcare variable considered. On the other hand, $\gamma < 0$, implies that the variable under consideration is not a priority for incumbents in the face of higher political competition i.e. it is not one of the axes of political competition. As a result, incumbents respond by reallocating resources away from such variables to healthcare coverage, for example, which is more-visible to voters. Next, we discuss the regression results.

5 Results

In this section, we present regression results from our IV estimation and then discuss the findings.

5.1 Main Results

The main objective of this paper is to understand the effect of political competition on different aspects of healthcare provision. As discussed in section 3.2, India's rural public health network comprises of different types of health facilities – health sub-centres, primary health centres, community health centres and government hospitals – each performing a distinct set of functions. In this section, we first examine how political competition affects access to each of these facilities. Furthermore, to get a larger picture, we investigate the effect of political competition on an index of healthcare access. We follow this with a similar analysis which focuses on health centre capacity.

Table 9, Column 1 in the appendix, presents first-stage results from regressing the effective number of parties (ENP) on the instrument – the electoral rank of turncoats (RT). The coefficient is positive and significant at the 1% level which indicates that the instrument is a strong predictor of the endogenous variable. Now, we turn to discussing the second-stage results.

Healthcare Access: Table 3, Panel A lays out results that relate to the effect of political competition on access to different kinds of public health facilities. We find that, after controlling for endogeneity, a one SD increase in political competition – measured as ENP by vote share – raises the probability that a village has access to healthcare facilities by 8% (= $0.109 \times 0.69 \times 100$, rounded to the nearest integer) to 15% (= $0.215 \times 0.69 \times 100$) across the different kinds of health facilities that we consider.

In Table 3, Panel A, columns 1–4 regress access to different types of health facilities on political competition after including the full set of controls and accounting for endogeneity. The results suggest that an increase in political competition differentially affects health facilities by type. While a one SD increase in political competition leads to a 7.5% increase, on average, for access to health sub-centres (column 1), it nearly doubles in size to 14.3% when we consider primary health centres (column 2), and marginally increases to 14.8% for community health centres (column 3).[22] For government hospitals, however, the effect size falls to about 8.8% which is comparable to the effect on sub-centres. However, the results are statistically significant only at the primary and community health centres. Column 5 considers a index of healthcare access. The positive coefficient suggests that overall political competition increases healthcare access.

The primary and the community health centres are more visible since these are the health centres that the majority access when they are ill. Therefore, it is not surprising that incumbents provide more of the visible public goods in response to political competition. With regard to the lack of significance for health sub-centres and hospitals, the results indicate that the primary axes of electoral competition are at the primary health centre and community health centre level rather than at health sub-centres and hospitals. However, health sub-centres have reasonable reach as Figure

[22] Refer to footnote 7 on page 5 which explains how we compute the values.

2 indicates and the effect of political competition actually turns significant when we examine the variable in per capita terms (see Table 14, Panel A, column 1).

[Table 3 about here.]

Health Centre Capacity: Table 3, Panel B considers the effect of political competition on different health capacity indicators at the sub-centre level whereas, Panel C presents results relating to capacity indicators at primary health centres.

With regard to capacity indicators at sub-centres in Table 3, Panel B, the largest impact seems to be on the presence of stethoscopes where a one SD increase in political competition raises the probability that it is present by about 25% (column 4). This is followed by the presence of a blood pressure monitor where the effect is a 21% increase (column 3). For the other components of HSC capacity, however, political competition exerts no measurable impact. Regarding primary health centre capacity, Table 3, Panel C shows that, similar to our findings relating to HSC capacity, political competition has no discernible impact on any of the variables relating to PHC capacity. Overall, the results suggest that political competition increases the provision of relatively inexpensive capacity items like stethoscopes and blood pressure monitors whereas, its impact is muted with respect to the other components.

Our results parallel findings in the education literature. Stasavage (2005), for example, finds that electoral competition encourages governments in African countries to prioritize primary schools which have mass appeal (i.e. that are more visible) over universities which do not have the same reach. Similarly, we find that incumbents focus on more visible health centres which is electorally rewarding instead of health centre capacity. Thus, visibility as a public good feature seems to play an important role in explaining the relationship between political competition and public provision.

5.2 Validity of the Instrument

In estimating the impact of political competition on public provision, we instrument political competition with the electoral rank of turncoats. We take precautions to ensure that our results are reliable: the electoral variables predate the healthcare surveys in all our regressions to attenuate bias arising from reverse feedback. We also include a list of controls to exclude the effect of potential confounders. In this section, we closely inspect the validity of the instrument.

Predictability of the Outcome: A critical reader might observe that turncoats are distinct from other contestants or, that electoral side-switching is more prevalent in districts with certain features such as voter turnout, the share of seats reserved for the disadvantaged sections of society, the share of female contestants, socio-economic characteristics such as population, urbanisation, literacy etc., which might raise con-

cerns about the endogeneity of the instrument.[23] For the instrumentation strategy to be valid, the electoral rank of turncoats cannot be predicted by observable political and socio-economic variables at the district-level.

To test this, Column 1, Table 4 regresses the electoral rank of turncoats – the instrumental variable – on the political variables mentioned above observed at time $(t-1)$, and include wave interacted district-specific socio-economic characteristics from the census year 2001 such as logged population, logged urban population and literacy along with district fixed effects and election-year fixed effects. Table 4 column 1 considers the full sample and shows that none of these variables turn out to be statistically significant i.e. they do not systematically determine the electoral rank of turncoats. In column 2 of the same table, we focus on a subset of observations prior to the year 2003 i.e. before the period relating to DLHS-2 survey, and find similar results. These results increase our confidence in the instrument.

[Table 4 about here.]

Imperfect Instrumental Variable (IIV): The two-stage least squares method that we employ to estimate the coefficient γ in eq. (3) assumes that the instrument and the unobserved error are uncorrelated. As Table 4 shows, the instrument is not systematically affected by a vector of observed political and socio-economic variables. However, it is still possible that the instrument is potentially endogenous in a way similar to political competition (the endogenous variable) i.e. the instrument may be imperfect.

Nevo and Rosen (2012) offer an appealing approach to test the sensitivity of IV estimates to the instrument itself being potentially endogenous i.e. to deal with imperfect instrumental variables (IIV). They relax the assumption of strict instrument exogeneity with the following two assumptions: (a) the instrumental variable and the unobserved error is correlated in the same direction as the endogenous variable and the error term; and (b) the instrument is less correlated with the error term than is the endogenous variable.[24] After imposing these two assumptions they derive analytic bounds for the parameter on the endogenous variable. The approach by Nevo and Rosen (2012) is particularly suited to our case. This allows us to generate one-sided bound for political competition – the endogenous variable in our case.

Table 5 presents results from IIV estimation. The values are qualitatively similar to the main IV estimates in Table 3 which builds confidence in our results. The one-sided lower bounds are presented along with their respective p-values. For example, in Table 5, Column 2 Panel A shows that the one-sided lower bound of the effect of political competition on access to primary health centres to be 0.178 with a p-value of 0.032. The coefficient is within some margin of the value of 0.208 obtained in our main IV estimate in Table 3, Column 2 in Panel A. Next, we discuss our findings.

[23] In section 6, we show that our results are robust to controlling for the incidence of turncoats at the district level.

[24] See Mitra and Mitra (2017) and Kailthya and Kambhampati (2021) for recent applications of this method.

[Table 5 about here.]

5.3 Discussion

Section 5.1 presents results that account for endogeneity of political competition. It confirms past observations in the literature regarding the significant shortfall in healthcare infrastructure in India (Fullman et al., 2018), particularly on the human resource dimension – doctors, nurses and health workers (Balarajan et al., 2011; Sharma, 2015; Rao et al., 2011). But, what is the political economic mechanism driving our results? Are we indeed capturing political influence as against some other factor such as bureaucratic ineffectiveness, for example? What is the implication of our findings?

In this paper, we contend that incumbents focus on more visible healthcare access rather than less visible health centre capacity since the former is more electorally rewarding. To test this, we examine whether the re-election prospects are higher for incumbents providing more visible public goods. Due to endogeneities in the relationship between changes in public provision and the re-election probability of the incumbent party, we provide suggestive evidence that the incumbent's electoral gain from more visible public goods exceed those from less visible public goods. Table 6 shows that a change in the more visible index of health centre access is positively associated with the re-election probability of the incumbent party (column 1) whereas, a change in the less visible capacity indices at HSCs and PHCs do not have any measurable impact on re-election prospects (columns 2 and 3, respectively of the same table). Hence, this presents a clear rationale for incumbents to focus on more visible public goods.

[Table 6 about here.]

Furthermore, to verify that political economic mechanisms are driving our results, we check for evidence regarding two distinct predictions from theory: first, we examine whether election-year cycles are present; and secondly, we investigate whether political alignment of districts with the majority party at the state level differentially affects public provision in aligned districts.

As discussed in section 2, re-election incentives combined with voter myopia (i.e. where voters rely more heavily on the recent past than the distant past) predicts election-year manipulation in public provision to project incumbent's ability. To check for this, we regress the respective outcome variables on political competition and an election-year dummy which captures the effect of election-year cycles. Once again, the results in Table 7 shows that political competition has the same impact as earlier even after accounting for election-year cycles. Importantly, we find that while the impact of election-year cycles predominantly affect small-budget consumption items such as the presence of examination tables, stethoscopes, blood pressure monitors and operating tables, it is not so for healthcare access which would take time to materialise.

[Table 7 about here.]

Another result that indicates a political economic mechanism at work is the evidence on political alignment affecting public provision. As discussed in section 2, partisan alignment of districts with the majority party at the state level confers an advantage to the aligned districts. To test this, we first construct a variable 'aligned' which takes a value of one if the leading political party at the district is aligned with the majority party at the state level, and it is zero otherwise. We then regress the respective outcome variables on political competition and aligned accounting for the endogeneity of political competition and including the full set of controls. Table 8 shows that, consistent with theory, the impact of political alignment concentrates on public goods that require greater vertical coordination effort – access to primary and community health centres and hospitals – but has no discernible effect on the capacity variables within health centres.

[Table 8 about here.]

To reiterate, we find that incumbents focus on more visible public goods (e.g. health centres) that are electorally rewarding instead of less visible public goods (e.g. health-centre capacity). We provide suggestive evidence that focusing on more visible public goods increases the incumbent party's re-election prospects. Furthermore, we find evidence of election-year cycles and partisan alignment affecting public provision. Taken together, the results present compelling evidence that our main findings are indeed driven by political economic mechanisms.

A key part of the causal chain in interpreting our result, however, is whether the policy mix that incumbents provide lead to distortions in health outcomes, in which case it is costly for voters, or if the policy mix is in fact socially desirable. To understand this, Table 10 in the appendix considers six key health outcomes reported at health centres: three outcomes at HSCs namely, new-born deaths, infant deaths, and maternal deaths, and another three outcomes at PHCs namely, the number of out-patients, in-patients, and hospital beds. All the six health outcomes are expressed in terms of per 10,000 district population and regressed on political competition and the full set of controls. After addressing endogeneity, we observe that political competition has no discernible impact on any of the health outcomes that we consider. Thus, the result shows that incumbent's incentive to get re-elected which induces them to focus on more visible public goods do not coincide with better healthcare outcomes.

6 Robustness

In this section, we present results from robustness checks.

Falsification test: Table 11 in the appendix lays out results from a falsification test that uses a one-period lead of the political competition variable i.e. political competition in the next, but not yet realised, election. The idea behind this is that we would not expect future realisations of political competition to affect healthcare provision

today. And, any such effect would signify some amount of post-election impetus in healthcare provision. The results from Table 11 in the appendix are along expected lines and most of the variables that were significant in the main result in Table 3 are no longer statistically significant except for CHCs which might take longer to build and likely to have some path dependence. Overall, the results suggest that post-election healthcare impetus is not a major concern.

Controlling for the incidence of turncoats: An astute reader might observe that in our baseline regression model, districts can potentially differ in their incidence of turncoats. And, because we instrument political competition by the rank of turncoats, any systematic differences across districts in the incidence of turncoats might affect our results. To alleviate this concern, we re-estimate our baseline regression model after controlling for the incidence of turncoats i.e. the percentage of assembly candidates that are turncoats aggregated at the district level. Table 12 in the appendix shows that our baseline results remain qualitatively unchanged even after controlling for the incidence of turncoats which increases confidence in our results.

Alternative measure of political competition: Here, we consider a different measure of political competition: minus the absolute value of the margin of victory i.e. VM = −|Vote Margin|, where the margin of victory is the difference in the vote share of the winner and the runner-up by constituency and averaged at the district level. Thus, higher values of VM (i.e. a vote margin closer to zero) indicate a rise in political competition whereas, political competition is low when the value is smaller.

We then estimate a model similar to eq.(3), where we replace ENP with VM as our measure of political competition. Figure 7 in the appendix plots the relationship between the the instrument – the electoral rank of turncoats – and VM and shows that the variables are positively correlated. In addition, the first-stage results in Table 9, column 2, suggests that the instrument is a strong predictor of VM.

Table 13 in the appendix shows second-stage results where we use VM to measure political competition. These results confirm our earlier findings that healthcare access which is more visible is also prioritized by incumbents. And, unlike our earlier results using ENP as a measure of political competition, the effect of VM is not significant for any of the capacity variables at the health sub-centres.

District-level Analysis: In the above regressions, we examined the effect of district level political competition on healthcare provision at the village or the facility level. One reason why we focus on granular data for the outcome variables is that it reduces measurement error and increases the precision of the estimated coefficients. Nonetheless, as a robustness check, we re-estimate our baseline regressions using aggregate outcomes at the districts measured in terms of per 10,000 population. Table 14 in the appendix lays out estimates where we regress the outcome variables in terms of per 10,000 population at the districts on political competition instrumented by the electoral rank of turncoats and including the full set of controls. The effects are qualitatively

similar to our baseline regressions in Table 3 which reinforces confidence in our main results.

7 Conclusion

In this paper, we examine the causal effect of political competition on public provision of healthcare in India, a developing economy with an established democracy, but which considerably lags behind its peers in terms of health outcomes. Using granular data from three rounds of DLHS survey administered in 2002, 2007 and 2013 combined with electoral data on assembly elections, we investigate the effect of political competition on public healthcare access and on health centre capacity. In our empirical estimation, we overcome the endogeneity of political competition by using an instrumental variable strategy. We control for time-invariant unobservables by including district and survey-wave fixed effects along with time-varying political factors and survey-wave interacted socio-economic variables at the district-level.

After accounting for endogeneity, we find that, incumbents respond to political competition by focusing on health centre access which is more visible. With regard to health centre capacity, the effect is only positive two of the variables and even that, only at the sub-centre level. Moreover, the effect of political competition on health centre capacity is not robust to using margin of victory as an alternative measure of political competition. A key insight is that incumbents trade-off less visible aspects of healthcare with more visible ones which distorts the mix of public provision in healthcare where information frictions are high, and which is to the detriment of voter's welfare. We provide suggestive evidence that incumbent's re-election concerns are driving our results and we are indeed capturing the effect of political influence. In addition, we conduct several robustness checks to ensure that our estimates are reliable.

Overall, our results indicate that the incumbent's incentive to get re-elected does not seem to coincide with better healthcare outcomes even if electoral competition is high. Thus, electoral competition much be accompanied by strong checks on accountability of public spending through more frequent audits by the independent Comptroller and Auditor General (CAG), for example, to meaningfully impact health outcomes.

Appendix

[Table 9 about here.]

[Table 10 about here.]

[Table 11 about here.]

[Table 12 about here.]

[Figure 7 about here.]

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Figures

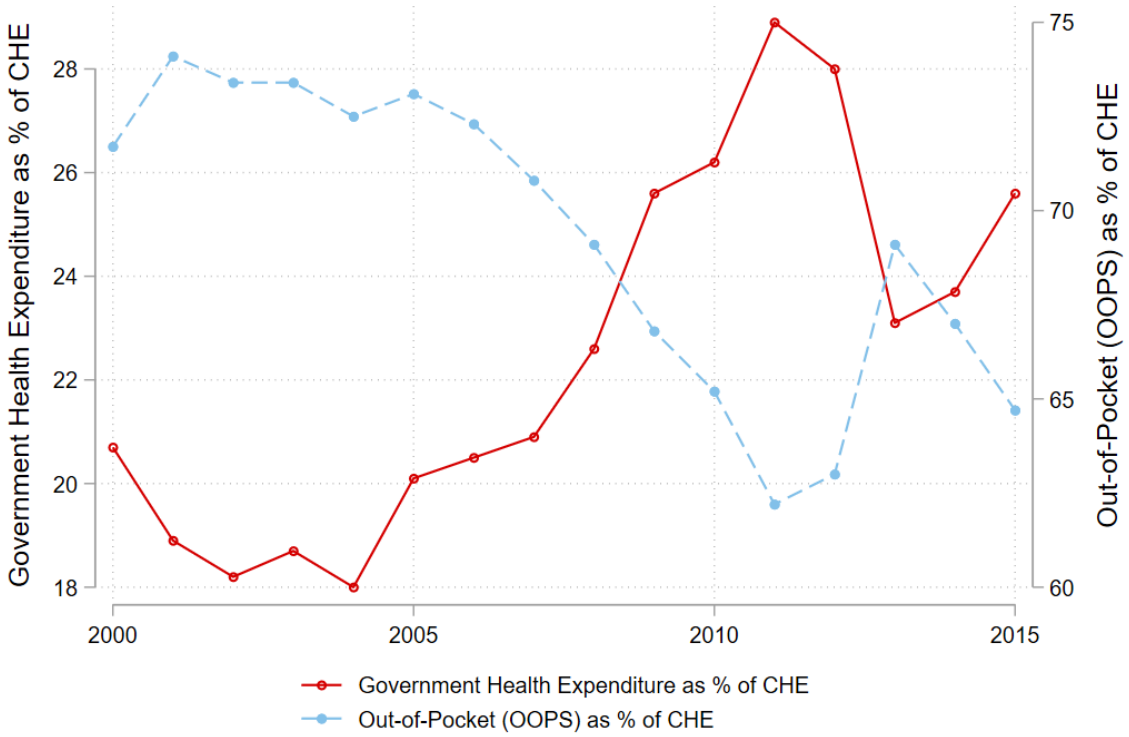

Figure 1: Healthcare Spending by Source in India.
Notes: Figure plots government health expenditure as a percentage of current health expenditure (CHE) in India during 2000-2015 on the left axis. It also plots the share of out-of-pocket expenditure (OOPS) as a percentage of CHE for the same period on the right axis. Data used in this figure is obtained from *Global Health Expenditure Database, WHO.*

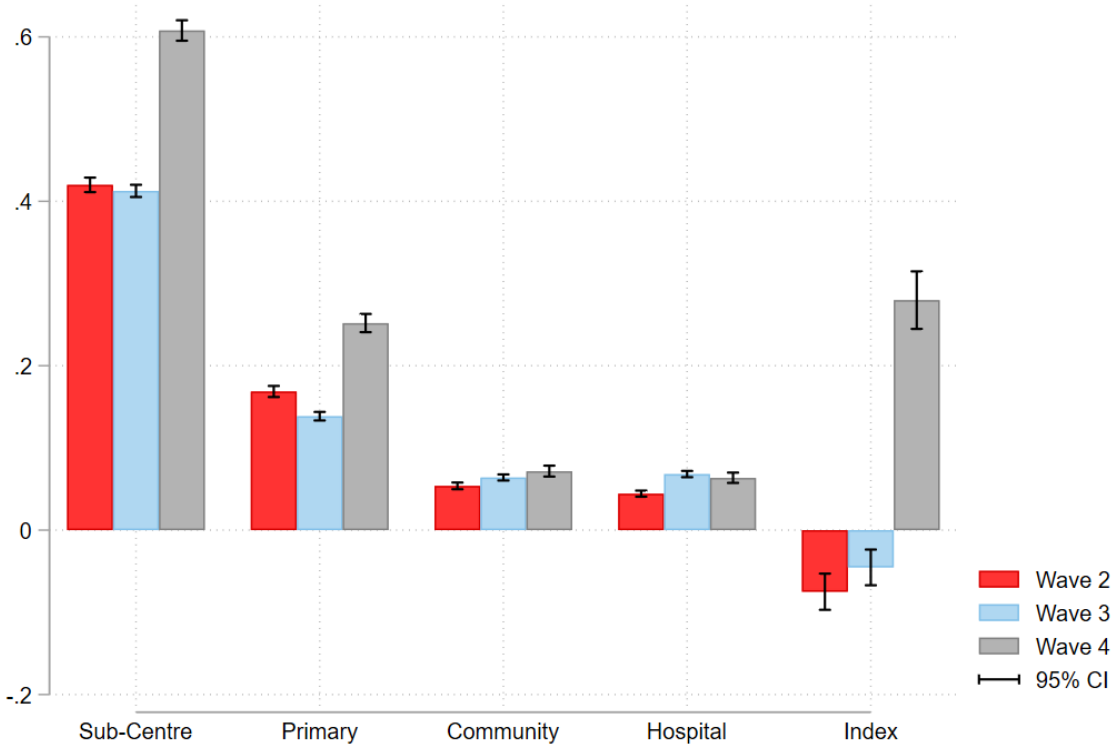

Figure 2: Healthcare Access by Survey-Wave.
Notes: Figure plots the percentage of villages that reported having access to each of the four types of health facilities by survey wave. Index is constructed using PCA from the four access variables.

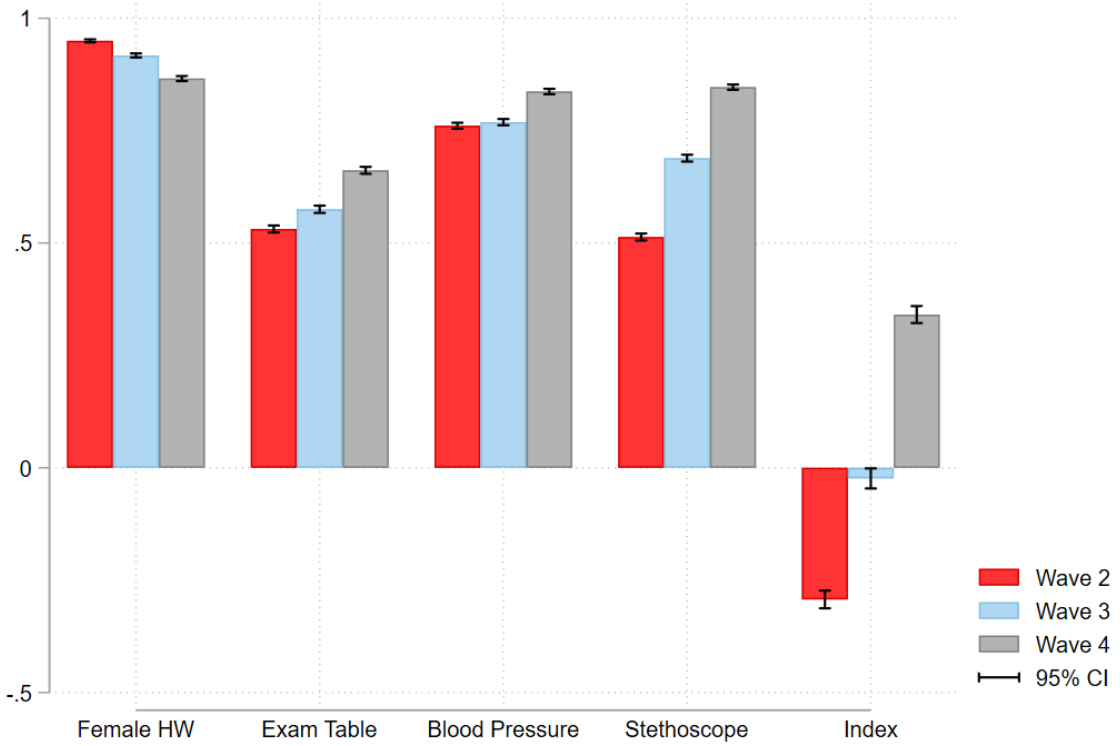

Figure 3: HSC Capacity by Survey-Wave.
Notes: Figure plots the percentage of sub-centres that reported having each of the four types of infrastructure by survey wave. Index is constructed using PCA from the four HSC infrastructure variables.

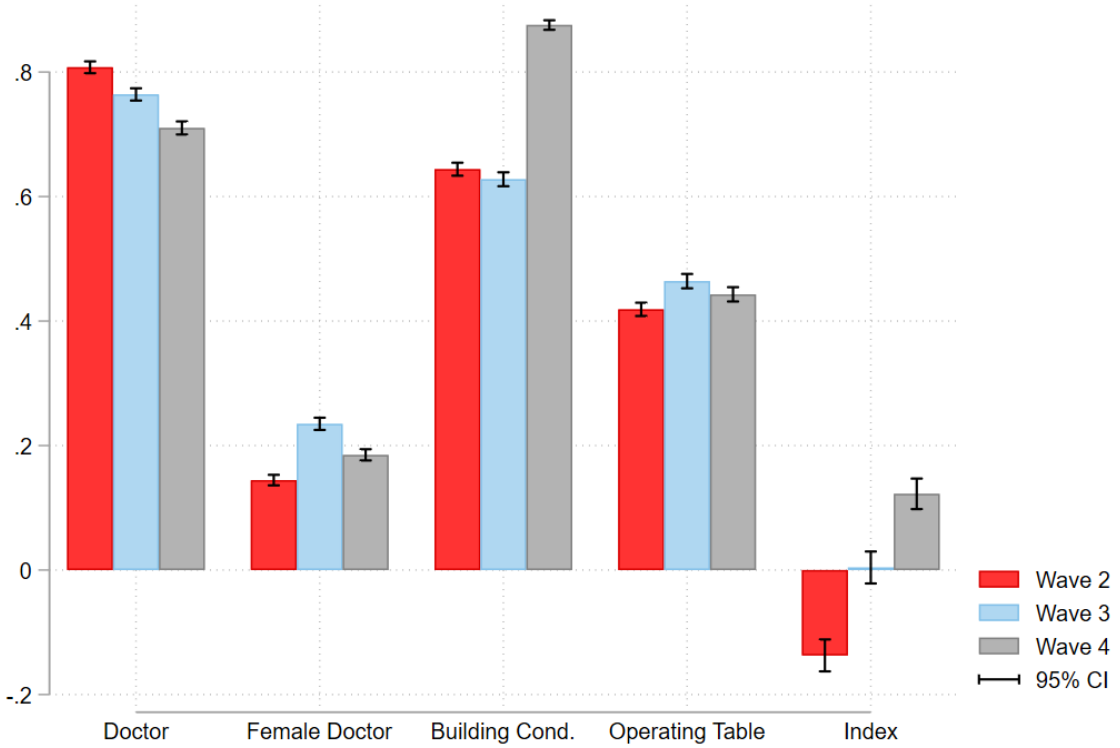

Figure 4: PHC Capacity by Survey-Wave.
Notes: Figure plots the percentage of primary health centres that reported having each of the four types of infrastructure by survey wave. Index is constructed using PCA from the four PHC infrastructure variables.

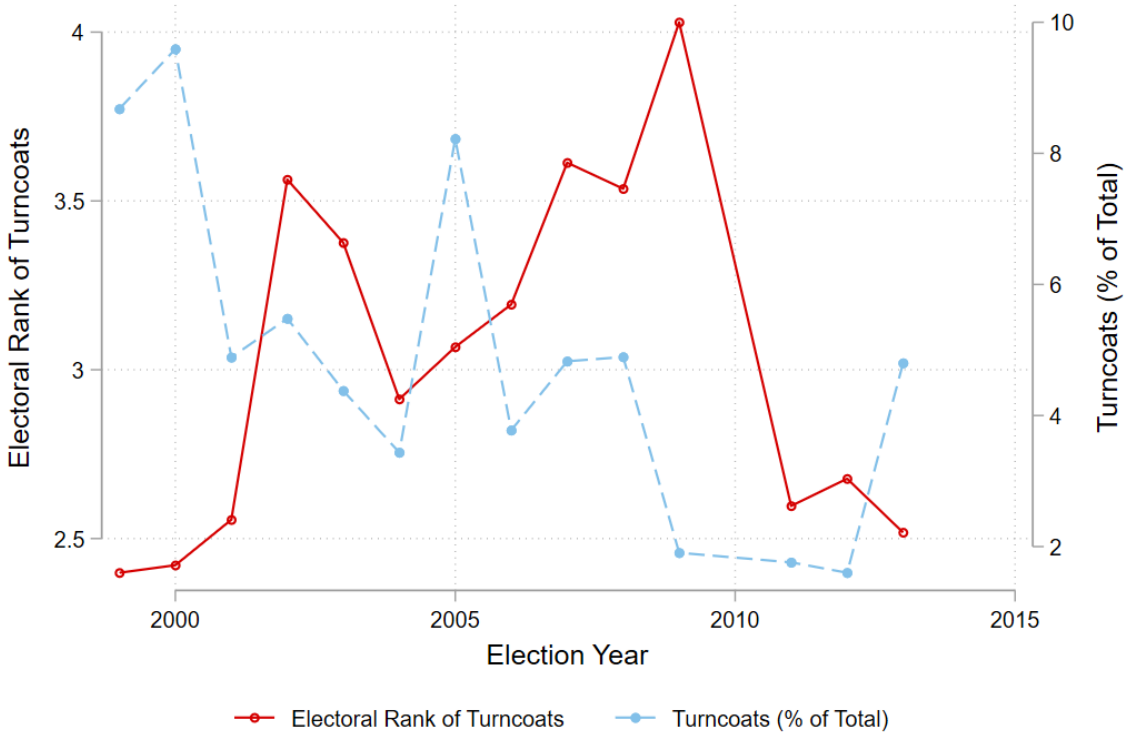

Figure 5: Electoral Rank of Turncoats and the Share of Turncoats by Election-Year.
Notes: The left axis relates to the electoral rank of turncoats averaged across all the districts in the sample and over the three survey waves by election-year. The right-axis relates to the share of turncoats as a percentage of the total candidates contesting a seat by election-year in the sample.

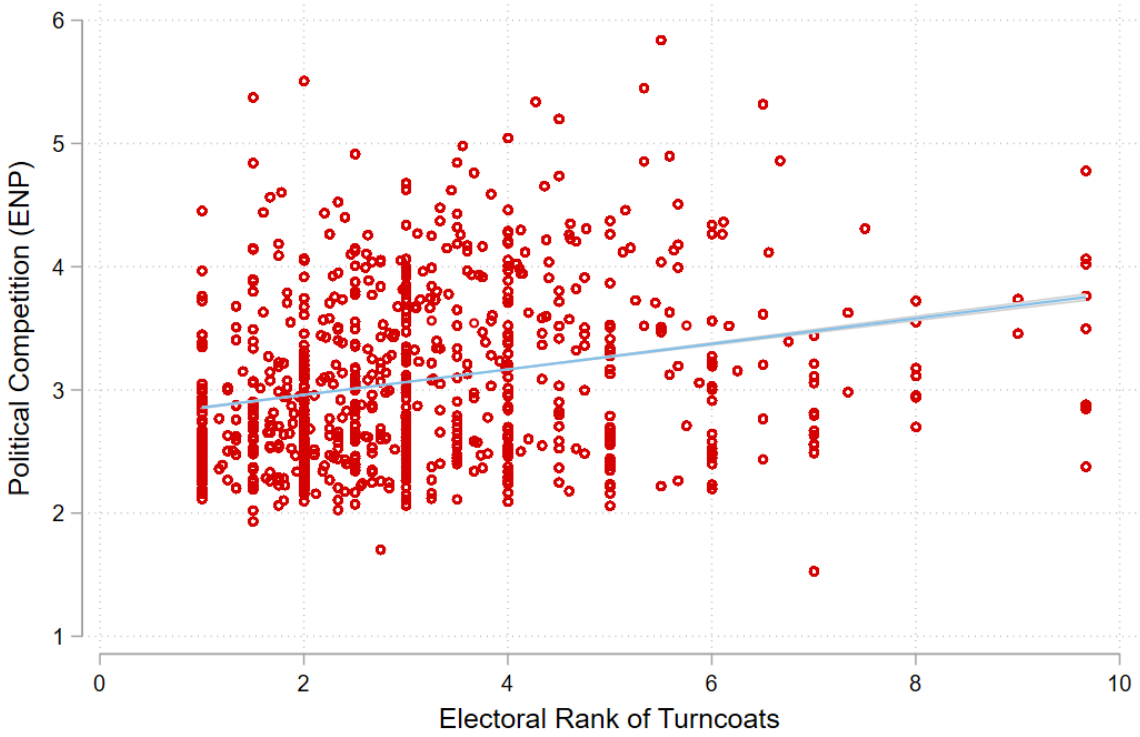

Figure 6: Electoral Rank of Turncoats and Political Competition (ENP).
Notes: The vertical axis plots political competition, measured by ENP, pooled across all the districts over the three waves in our sample. The horizontal axis plots the rank of turncoats in an electoral race aggregated at the district level. A linear fit with 95% confidence band is plotted which clearly shows a positive gradient.

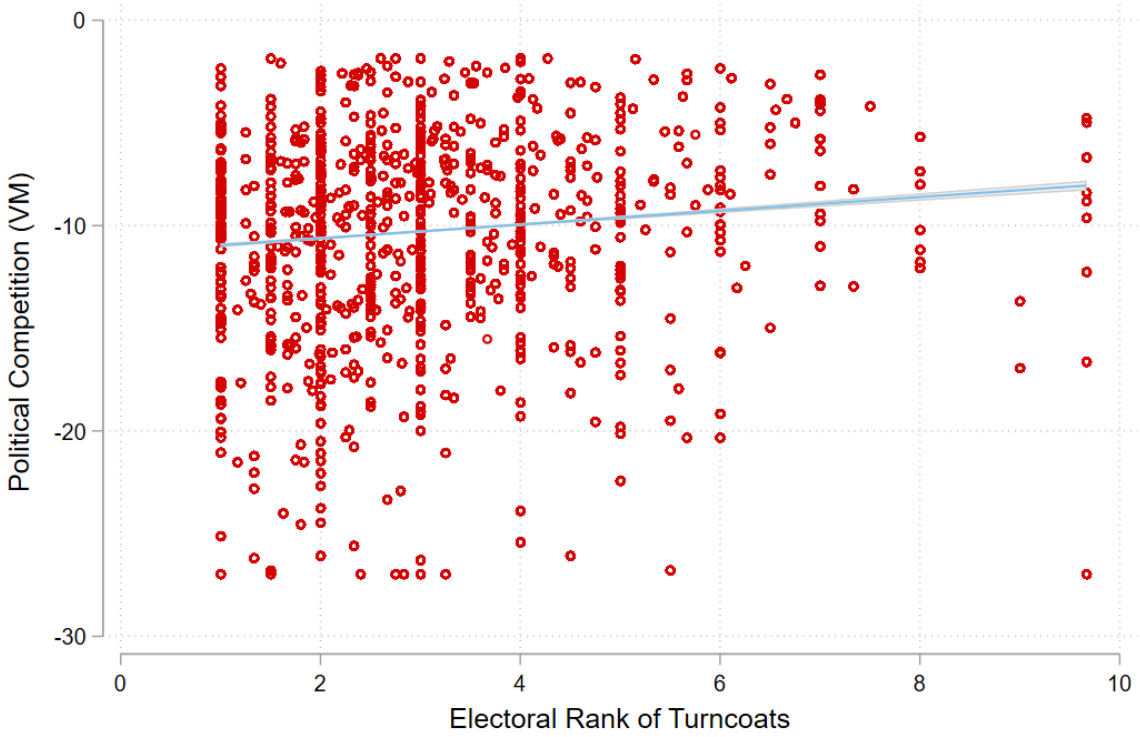

Figure 7: Electoral Rank of Turncoats and Political Competition (VM).
Notes: The vertical axis plots political competition measured as $VM = -|\text{Vote Margin}|$ pooled across all the districts over the the three waves in our sample. The horizontal axis plots the rank of turncoats in an electoral race aggregated at the district level. A linear fit with 95% confidence band is plotted which clearly shows a positive gradient.

Tables

Table 1: Public Health System in India

Level	Function	Population covered		Annual Cost	
		Norm	Actual	Total (in INR mil)	Per capita (in INR)
HSC	Most peripheral; first point of contact between primary healthcare system and the community in rural areas.	3,000-5,000	5,615	1.03	187
PHC	First point of contact with a qualified physician; provides basic preventative, promotive, curative and rehabilitative care and act as referral units	20,000-30,000	34,641	8.8	170.8
CHC	Block level health administrative units and gatekeeper for referrals to higher level facilities.	80,000-120,000	172,375	26.9	162.1

Notes: Data on healthcare coverage sourced from rural population of census 2011. The lower value of the coverage norm is for hilly/ tribal areas whereas, the higher value is for plains. Data on HSC cost obtained from Prinja et al. (2014) while data on PHC and CHC cost obtained from Prinja et al. (2016). Health facility cost data are based on a study of three north-Indian states.

Table 2: Descriptive Statistics: Covariates, Instruments and Controls

	Observations	Mean	SD	Min	Max
Political Competition (ENP)	34706	2.99	0.69	1.53	5.84
Political Competition (VM)	34706	-10.39	5.16	-26.96	-1.85
Electoral Rank of Turncoats	28292	3.13	1.68	1.00	9.67
Turnout (%)	34706	65.91	10.62	36.31	89.26
Scheduled Caste Seats (%)	34706	16.52	13.67	0.00	100.00
Female Contestants (%)	34706	7.05	10.88	0.00	66.67
Logged Population	35179	14.37	0.60	12.14	16.08
Logged Urban Population	35086	12.63	0.96	9.80	15.59
Literacy Rate (%)	35179	63.26	12.13	30.53	95.82

Notes: Table shows descriptive statistics using observations pooled across districts and over three survey waves. ENP = Effective number of parties by vote share; VM = −|Vote Margin|.

Table 3: Effect of Political Competition on Healthcare Provision, 2SLS

	Panel A: Healthcare Access				
	(1) Sub-centre	(2) Primary	(3) Community	(4) Hospital	(5) Index
Political Competition	0.109	0.208**	0.215***	0.128	1.156**
	(0.090)	(0.089)	(0.082)	(0.079)	(0.519)
RMSE	0.471	0.339	0.214	0.193	1.165
KP F-test	20.77	21.37	21.33	20.71	20.70
Mean of Dep. Variable	0.44	0.15	0.06	0.05	-0.06
Observations	28163	28248	28241	28160	28139
	Panel B: Capacity Indicators at Health Sub-centres				
	Female HW	Examination Table	BP Monitor	Stethoscope	Index
Political Competition	-0.043	0.254	0.300*	0.359*	1.135*
	(0.092)	(0.166)	(0.176)	(0.192)	(0.612)
RMSE	0.254	0.437	0.385	0.418	1.168
KP F-test	9.74	9.65	9.66	9.65	9.74
Mean of Dep. Variable	0.92	0.59	0.78	0.67	-0.02
Observations	36600	36649	36646	36648	36589
	Panel C: Capacity Indicators at Primary Health Centres				
	Doctor	Female Doctor	Building Condition	Operating Table	Index
Political Competition	-0.165	0.125	-0.096	-0.112	-0.323
	(0.229)	(0.204)	(0.179)	(0.197)	(0.481)
RMSE	0.397	0.325	0.440	0.434	0.972
KP F-test	4.57	4.78	5.67	5.79	4.57
Mean of Dep. Variable	0.76	0.16	0.67	0.43	-0.10
Observations	14919	14960	16183	16202	14898
Wave FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Political controls	Yes	Yes	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes	Yes	Yes

Notes: Table shows the relationship between political competition, measured as ENP, and healthcare access (Panel A) and capacity indicators at sub-centres (Panel B) and primary health centres (Panel C). Dependent variables are as in columns. Political competition is instrumented by the electoral rank of turncoats. All regressions include a constant term and includes district and survey-wave fixed effects along with political controls – the percentage of scheduled caste seats, the percentage of female candidates and turnout – and wave interacted district-level variables – logged population, logged urban population and literacy rate. Political variables relate to the election-year prior to the survey-year. KP F-test is the Kleibergen-Paap weak identification test of instrument validity. Standard errors in parenthesis are clustered at the district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Instrument Validity: Predictability of the Outcome.

	Full-Sample	Pre-2003
	(1)	(2)
Turnout (%)	-0.022	-0.016
	(0.014)	(0.010)
Scheduled Caste Seats (%)	0.097	-0.308
	(1.505)	(0.504)
Female Contestants (%)	0.623	0.626
	(0.700)	(0.842)
Wave × log(Population)	-0.153	0.149
	(0.106)	(0.096)
Wave × log(Urban Population)	0.166	-0.054
	(0.129)	(0.060)
Wave × Literacy (%)	0.002	-0.002
	(0.007)	(0.003)
Election-Year FE	Yes	Yes
District FE	Yes	No
Adj. R- Squared	0.655	0.168
Observations	28292	8623

Notes: Table regresses the instrument – the electoral rank of turncoats – on a list of covariates. All regressions include a constant term and control for district fixed effects and election-year fixed effects. Standard errors in parenthesis are clustered at district-election year level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: IIV Estimation

	Panel A: Healthcare Access				
	(1) Sub-centre	(2) Primary	(3) Community	(4) Hospital	(5) Index
Political Competition	[0.082,.)	[0.178,.)	[0.165,.)	[0.096,.)	[0.902,.)
	(-0.050,.)	(0.032,.)	(0.072,.)	(0.010,.)	(0.393,.)
Observations	28163	28248	28241	28160	28139
	Panel B: Capacity Indicators at Health Sub-centres				
	Female HW	Examination Table	BP Monitor	Stethoscope	Index
Political Competition	[0.056,.)	[0.084,.)	[0.258,.)	[0.254,.)	[0.804,.)
	(0.040,.)	(0.003,.)	(0.023,.)	(0.000,.)	(0.078,.)
Observations	36600	36649	36646	36648	36589
	Panel C: Capacity Indicators at Primary Health Centres				
	Doctor	Female Doctor	Building Condition	Operating Table	Index
Political Competition	[-0.039,.)	[0.156,.)	[-0.053,.)	[-0.002,.)	[-0.174,.)
	(-0.081,.)	(-0.050,.)	(-0.098,.)	(-0.090,.)	(-0.274,.)
Observations	14919	14960	16183	16202	14898
Wave FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Political controls	Yes	Yes	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes	Yes	Yes

Notes: Table shows results from IIV estimation based on the approach developed by Nevo and Rosen (2012). One-sided lower bounds of the estimates are generated with their respective 95% lower confidence interval in parenthesis.

Table 6: Healthcare Provision and Re-election Probability

	(1)	(2)	(3)
Δ Healthcare Access Index	0.026*		
	(0.014)		
Δ HSC Index		-0.008	
		(0.006)	
Δ PHC Index			-0.001
			(0.010)
Wave FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
Political controls	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes
RMSE	0.178	0.212	0.214
Observations	322	514	514

Notes: Table shows the relationship between changes in healthcare provision and the incumbent party's re-election probability. Col.(1) relates to the effect of changes in the index of healthcare access, col.(2) relates to changes in HSC index, while col.(3) relates to changes in PHC index. Re-election probability is the share of legislative assembly seats at the district-level where the incumbent party was re-elected. Standard errors in parenthesis are clustered at district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Effect of Electoral Cycle on Healthcare Provision

	Panel A: Healthcare Access				
	(1) Sub-centre	(2) Primary	(3) Community	(4) Hospital	(5) Index
Political Competition (ENP)	0.109	0.208**	0.214***	0.124	1.143**
	(0.089)	(0.089)	(0.081)	(0.079)	(0.517)
Election year	0.004	-0.004	-0.019	-0.039***	-0.132
	(0.020)	(0.017)	(0.013)	(0.013)	(0.083)
RMSE	0.471	0.339	0.213	0.193	1.164
KP F-test	20.80	21.40	21.36	20.74	20.73
Observations	28163	28248	28241	28160	28139
	Panel B: Capacity Indicators at Health Sub-centres				
	Female HW	Examination Table	BP Monitor	Stethoscope	Index
Political Competition (ENP)	-0.043	0.264	0.317*	0.373*	1.191*
	(0.093)	(0.165)	(0.177)	(0.194)	(0.613)
Election year	-0.004	0.112**	0.188***	0.152***	0.591***
	(0.019)	(0.044)	(0.045)	(0.050)	(0.157)
RMSE	0.254	0.437	0.384	0.418	1.167
KP F-test	9.73	9.65	9.66	9.65	9.73
Observations	36600	36649	36646	36648	36589
	Panel C: Capacity Indicators at Primary Health Centres				
	Doctor	Female Doctor	Building Condition	Operating Table	Index
Political Competition (ENP)	-0.172	0.122	-0.093	-0.117	-0.338
	(0.228)	(0.200)	(0.178)	(0.195)	(0.473)
Election year	0.079*	0.042	-0.062	0.103**	0.182*
	(0.048)	(0.038)	(0.038)	(0.044)	(0.100)
RMSE	0.397	0.325	0.440	0.434	0.972
KP F-test	5.00	5.23	6.12	6.25	5.01
Observations	14919	14960	16183	16202	14898
Wave FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Political controls	Yes	Yes	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes	Yes	Yes

Notes: Table shows the effect of electoral cycles on healthcare access (Panel A) and capacity indicators at sub-centres (Panel B) and primary health centres (Panel C). Dependent variables are as in columns. Political competition is instrumented by the electoral rank of turncoats. Electoral cycle is an indicator variable that takes a value of 1 if it is an election year and zero otherwise. All regression sinclude the full set of controls. KP F-test is the Kleibergen-Paap weak identification test of instrument validity. Standard errors in parenthesis are clustered at the district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Effect of Alignment on Healthcare Provision

	Panel A: Healthcare Access				
	(1) Sub-centre	(2) Primary	(3) Community	(4) Hospital	(5) Index
Political Competition (ENP)	0.085	0.209**	0.227**	0.161*	1.239**
	(0.096)	(0.098)	(0.091)	(0.091)	(0.587)
Aligned	0.004	0.077**	0.071**	0.059*	0.405*
	(0.035)	(0.037)	(0.033)	(0.032)	(0.209)
RMSE	0.471	0.336	0.210	0.188	1.157
KP F-test	17.58	18.17	18.13	17.51	17.49
Observations	27000	27085	27079	26998	26977
	Panel B: Capacity Indicators at Health Sub-centres				
	Female HW	Examination Table	BP Monitor	Stethoscope	Index
Political Competition (ENP)	-0.264	0.497	0.401	0.622	1.716
	(0.206)	(0.372)	(0.341)	(0.474)	(1.321)
Aligned	-0.045	-0.001	0.000	0.043	0.032
	(0.044)	(0.083)	(0.073)	(0.105)	(0.288)
RMSE	0.243	0.446	0.388	0.438	1.195
KP F-test	2.77	2.73	2.73	2.73	2.77
Observations	33286	33336	33333	33335	33276
	Panel C: Capacity Indicators at Primary Health Centres				
	Doctor	Female Doctor	Building Condition	Operating Table	Index
Political Competition (ENP)	-0.471	0.050	0.040	-0.494	-1.350
	(0.625)	(0.427)	(0.345)	(0.461)	(1.461)
Aligned	-0.154	-0.077	0.104*	-0.067	-0.331
	(0.130)	(0.082)	(0.057)	(0.082)	(0.309)
RMSE	0.403	0.323	0.443	0.446	0.994
KP F-test	0.94	1.05	1.66	1.72	0.93
Observations	14059	14100	15323	15344	14040
Wave FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Political controls	Yes	Yes	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes	Yes	Yes

Notes: Table shows the effect of political alignment on healthcare access (Panel A) and capacity indicators at sub-centres (Panel B) and primary health centres (Panel C). Dependent variables are as in columns. Political competition is instrumented by the electoral rank of turncoats. Aligned denotes the share of assembly constituencies at the district-level where the winning candidate belongs to the same political party as the majority party at the state-level. All regressions include the full set of controls. KP F-test is the Kleibergen-Paap weak identification test of instrument validity. Standard errors in parenthesis are clustered at the district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Effect of IV on Political Competition, First-Stage Results

	$ENP_{d,t-1}$	$VM_{d,t-1}$
	(1)	(2)
$RT_{d,t-1}$	0.259**	0.046***
	(0.124)	(0.010)
Wave FE	Yes	Yes
District FE	Yes	Yes
Political controls	Yes	Yes
Controls × Wave	Yes	Yes
Observations	28139	28139

Notes: Table shows first-stage results. The dependent variable in column 1 is the effective number of parties by vote share (ENP), while in column 2 it is minus the absolute value of the vote margin, $VM = -|\text{Vote Margin}|$. RT is the electoral rank of turncoats. Standard errors in parenthesis are clustered at the district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Effect of Political Competition on Health Outcomes

	Panel A: HSC		
	(1) New-born Deaths	(2) Infant Deaths	(3) Maternal Deaths
Political Competition (ENP)	0.332	0.171	-0.008
	(0.207)	(0.167)	(0.025)
RMSE	0.184	0.202	0.023
KP F-test	9.89	9.89	9.89
Mean of Dep. Variable	0.14	0.13	0.02
Observations	819	819	819
	Panel B: PHC		
	Out-patients	In-patients	Beds
Political Competition (ENP)	-18.060	0.726	0.171
	(45.303)	(2.587)	(0.205)
RMSE	40.067	2.716	0.158
KP F-test	9.80	9.80	9.80
Mean of Dep. Variable	57.71	2.25	0.43
Observations	818	818	818
Wave FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
Political controls	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes

Notes: Table shows the relationship between political competition, measured as ENP, and district-level health outcomes at the HSC level (Panel A) and the PHC level (Panel B). Dependent variables are as in columns and expressed in per 10,000 population at the district-level. Political competition is instrumented by the electoral rank of turncoats. All regressions include the full set of controls. KP F-test is the Kleibergen-Paap weak identification test of instrument validity. Standard errors in parenthesis are clustered at the district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Falsification Test

	Panel A: Healthcare Access				
	(1) Sub-centre	(2) Primary	(3) Community	(4) Hospital	(5) Index
Political Competition$_{t+1}$	-0.133	0.112	0.176**	0.061	0.596
	(0.102)	(0.072)	(0.075)	(0.064)	(0.404)
RMSE	0.471	0.333	0.209	0.192	1.124
KP F-test	10.66	11.07	11.05	10.66	10.54
Observations	27030	27165	27159	27030	27001
	Panel B: Capacity Indicators at Health Sub-centres				
	Female HW	Examination Table	BP Monitor	Stethoscope	Index
Political Competition$_{t+1}$	0.006	0.097	0.122	-0.004	0.267
	(0.073)	(0.137)	(0.149)	(0.148)	(0.492)
RMSE	0.252	0.429	0.387	0.416	1.159
KP F-test	11.98	12.00	12.00	12.00	11.98
Observations	34432	34483	34482	34482	34425
	Panel C: Capacity Indicators at Primary Health Centres				
	Doctor	Female Doctor	Building Condition	Operating Table	Index
Political Competition$_{t+1}$	-0.244*	0.095	-0.085	-0.012	-0.133
	(0.128)	(0.109)	(0.139)	(0.154)	(0.346)
RMSE	0.395	0.330	0.444	0.433	0.979
KP F-test	13.83	14.00	11.11	11.23	13.82
Observations	14132	14178	15412	15432	14110
Wave FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Political controls	Yes	Yes	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes	Yes	Yes

Notes: Table shows results from a falsification test where the dependent variables are respectively regressed on one-period lead of political competition i.e. from the next election round denoted by time, $t+1$, and instrumented by the electoral rank of turncoats at time, $t+1$. Panel A presents results relating to healthcare access, Panel B relates to capacity indicators at sub-centres while Panel C relates to capacity indicators at primary health centres. Dependent variables are as in columns. All regressions include the full set of controls as in Table 3. KP F-test is the Kleibergen-Paap weak identification test of instrument validity. Standard errors in parenthesis are clustered at the district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Controlling for the Incidence of Turncoats

	Panel A: Healthcare Access				
	(1) Sub-centre	(2) Primary	(3) Community	(4) Hospital	(5) Index
Political Competition (ENP)	0.096	0.188**	0.193**	0.114	1.036**
	(0.087)	(0.085)	(0.077)	(0.076)	(0.495)
RMSE	0.470	0.338	0.212	0.193	1.157
KP F-test	21.78	22.38	22.33	21.72	21.71
Observations	28163	28248	28241	28160	28139
	Panel B: Capacity Indicators at Health Sub-centres				
	Female HW	Examination Table	BP Monitor	Stethoscope	Index
Political Competition (ENP)	-0.033	0.220	0.256	0.340*	1.018*
	(0.091)	(0.161)	(0.170)	(0.189)	(0.594)
RMSE	0.254	0.435	0.383	0.417	1.160
KP F-test	9.63	9.54	9.55	9.54	9.63
Observations	36600	36649	36646	36648	36589
	Panel C: Capacity Indicators at Primary Health Centres				
	Doctor	Female Doctor	Building Condition	Operating Table	Index
Political Competition (ENP)	-0.209	0.119	-0.058	-0.130	-0.368
	(0.242)	(0.209)	(0.180)	(0.198)	(0.495)
RMSE	0.398	0.325	0.440	0.434	0.973
KP F-test	4.33	4.54	5.55	5.67	4.34
Observations	14919	14960	16183	16202	14898
Wave FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Political controls	Yes	Yes	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes	Yes	Yes

Notes: Table shows results from re-estimating the regressions in Table 3 after additionally controlling for the incidence of turncoats per assembly constituency aggregated at the district level. All regressions are otherwise similar to that in Table 3. KP F-test is the Kleibergen-Paap weak identification test of instrument validity. Standard errors in parenthesis are clustered at the district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Alternative Measure of Political Competition

	Panel A: Healthcare Access				
	(1) Sub-centre	(2) Primary	(3) Community	(4) Hospital	(5) Index
Political Competition (VM)	0.019	0.036**	0.038**	0.022*	0.204**
	(0.016)	(0.018)	(0.017)	(0.014)	(0.101)
RMSE	0.472	0.351	0.235	0.199	1.267
KP F-test	4.38	4.55	4.55	4.37	4.35
Observations	28163	28248	28241	28160	28139
	Panel B: Capacity Indicators at Health Sub-centres				
	Female HW	Examination Table	BP Monitor	Stethoscope	Index
Political Competition (VM)	-0.015	0.086	0.101	0.122	0.384
	(0.038)	(0.152)	(0.170)	(0.204)	(0.640)
RMSE	0.260	0.525	0.516	0.589	1.749
KP F-test	0.41	0.41	0.41	0.41	0.41
Observations	36600	36649	36646	36648	36589
	Panel C: Capacity Indicators at Primary Health Centres				
	Doctor	Female Doctor	Building Condition	Operating Table	Index
Political Competition (VM)	-0.018	0.013	-0.009	-0.011	-0.034
	(0.029)	(0.021)	(0.018)	(0.020)	(0.059)
RMSE	0.401	0.324	0.440	0.434	0.978
KP F-test	1.73	1.81	2.39	2.44	1.76
Observations	14919	14960	16183	16202	14898
Wave FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Political controls	Yes	Yes	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes	Yes	Yes

Notes: Table shows results from a robustness test where the dependent variables are respectively regressed on an alternative measure of political competition, measured as $VM = -|\text{Vote Margin}|$, and where VM is instrumented by the electoral rank of turncoats. Panel A presents results relating to healthcare access, Panel B relates to capacity indicators at sub-centres while Panel C relates to capacity indicators at primary health centres. Dependent variables are as in columns. All regressions include the full set of controls as in Table 3. Political variables relate to the election-year prior to the survey-year. KP F-test is the Kleibergen-Paap weak identification test of instrument validity. Standard errors in parenthesis are clustered at the district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 14: District-level Estimates: Effect of Political Competition on Healthcare Provision

	Panel A: Healthcare Access				
	(1) Sub-centre	(2) Primary	(3) Community	(4) Hospital	(5) Index
Political Competition (ENP)	0.046*	0.046*	0.049*	0.033	1.296
	(0.027)	(0.026)	(0.025)	(0.024)	(0.885)
RMSE	0.026	0.024	0.023	0.024	0.839
KP F-test	16.30	16.30	16.30	16.30	16.30
Mean of Dep. Variable	0.06	0.02	0.01	0.01	-0.21
Observations	760	760	760	760	760
	Panel B: Capacity Indicators at Health Sub-centres				
	Female HW	Examination Table	BP Monitor	Stethoscope	Index
Political Competition (ENP)	0.055	0.078	0.092	0.111*	2.752
	(0.056)	(0.060)	(0.067)	(0.066)	(1.996)
RMSE	0.049	0.049	0.055	0.056	1.262
KP F-test	9.89	9.89	9.89	9.89	9.89
Mean of Dep. Variable	0.18	0.11	0.15	0.13	0.22
Observations	819	819	819	819	819
	Panel C: Capacity Indicators at Primary Health Centres				
	Doctor	Female Doctor	Building Condition	Operating Table	Index
Political Competition (ENP)	0.039	0.007	0.026	0.028	1.366
	(0.037)	(0.014)	(0.024)	(0.021)	(1.339)
RMSE	0.030	0.012	0.021	0.015	0.841
KP F-test	9.80	9.80	9.80	9.80	9.80
Mean of Dep. Variable	0.07	0.02	0.07	0.04	0.23
Observations	818	818	818	818	818
Wave FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Political controls	Yes	Yes	Yes	Yes	Yes
Controls × Wave	Yes	Yes	Yes	Yes	Yes

Notes: Table shows the relationship between political competition, measured as ENP, and healthcare access (Panel A) and capacity indicators at sub-centres (Panel B) and primary health centres (Panel C) at the district-level. Dependent variables are as in columns and denote the provision of each of the variables at the district-level per 10,000 population. Political competition is instrumented by the electoral rank of turncoats. All regressions include the full set of controls. KP F-test is the Kleibergen-Paap weak identification test of instrument validity. Standard errors in parenthesis are clustered at the district-wave level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$