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Health Reform Monitor

The 2018 risk-adjustment reform in the Czech Republic: Introducing Pharmacy-based Cost Groups and strengthening reinsurance*

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ABSTRACT

Background: Risk-adjustment in resource allocation is commonly used for regional redistribution or for eliminating risk selection motives of multiple statutory health insurers. In the Czech Republic, revenue redistribution between health insurers takes place since the 1990′s. Since 2018, the risk-adjustment mechanism includes an adjustment for insured with chronic diseases using Pharmacy-based Cost Group (PCG) classification. In addition, retrospective compensation for very high cost patients has been strengthened.
Aim: To provide an internationally relevant overview of the Czech risk-adjustment system. To assess the implication of the 2018 reform for health insurers and for the development of chronic care.
Method: The framework of the Health Reform Monitor is used to analyse the policy process. Data from Czech health insurers and Czech Ministry of Health are used to assess likely impact of the reform.
Results: The reform increases coverage of predictable individual health risks and combines prospective risk-rating with strengthened retrospective risk-sharing among insurers. The reform results in moderate changes in risk-adjusted allocations of individual insurers.
Conclusion: The Czech experience with risk-adjustment reforms is relevant for countries with multiple health insurers as well as for countries with risk-adjusted regional redistribution mechanisms. Combining prospective risk factors of age, sex, and PCGs with retrospective compensation of expensive cases limits potential losses to a manageable level, also for small risk-pools. It reduces incentives for cream skimming based on health status, enables higher use of risk-sharing contracts, and incentivizes the development of disease management programs in the Czech Republic.

1. Introduction

The Czech Republic has a system of statutory health insurance (SHI) based on compulsory membership in one of the health insurance funds. The insurers are quasi-public, self-governing bodies that act as payers and purchasers of care. Czech residents may freely choose their health insurer as well as health care providers [1].

Pooling of funds is an important health system function, used for regional redistribution or for eliminating risk selection in systems with multiple statutory health insurers where compensation for predictable health care costs is needed [2]. In publicly financed SHI, premium regulations usually do not allow for risk rated premiums. Without proper compensation, insurers' behaviour is influenced by a cream skimming potential based on income, age or health status [3]. In the Czech Republic, risk adjustment and redistribution of collected revenues are in place since the 1990′s, with major change in scope and definition of the redistribution formula taking place during 2004–2006. From January 2018, the mechanism newly adds adjustment for clients with chronic diseases identified by their pharmaceutical consumption, using Pharmacy-based Cost Groups (PCG).

The article provides an overview of pooling of funds and risk adjustment in the Czech health care system and analyses expected impact of its 2018 reform. Looking at ability to explain the variation in individual health care costs, it presents comparison of the Czech redistribution model with models that are used in Slovakia and in the Netherlands. Based on data from Czech health insurers and from the Czech Ministry of Health it assesses reform implications

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for individual statutory health insurers and a potential for further chronic care development.

2. Political and economic background

In the Czech Republic, compulsory health insurance was introduced in 1992 with the right to entitlement based on permanent residence, not contribution. The insurance was initially managed by a single insurance fund (the General Health Insurance Fund, VZP), but soon after other not-for-profit insurers – with a legal status of independent public entities – were introduced [4]. As of 2018, there are 7 statutory health insurance funds. VZP is the biggest insurer with 57% of market share in terms of headcount.

Competition among health insurers is limited, given the generous and very broad benefits package defined by law. In 2018, the benefit package consisted of inpatient and outpatient care, prescription pharmaceuticals, rehabilitation; home nursing care and personal care; basic dental care; medical aids and devices; vaccinations and screenings; maternity care; and spa treatment [5]. Care is provided free of charge at the point of use and patients are protected with robust policies against cost sharing [6]. Premiums, collected by each insurer individually, are set as a uniform payroll tax, thus there is no competition on price. More information on the Czech health insurance market can be found in Alexa et al. [1].

With centrally defined payroll tax rate, broad benefits package and without risk pooling, cream skimming of young, rich and healthy people would be a rational behaviour of an insurer [7,8]. Therefore, since the Czech SHI establishment in the 1990′s, ideas on risk adjustment and redistribution of available funds have been present and gradually implemented.

In 1994, a simple risk-adjustment mechanism as part of the national pooling arrangement was introduced. 60% of collected premiums and the whole state budget payment on behalf of economically inactive people were subject to redistribution among insurers [8]. Risk adjustment was based on the number of economically inactive people. Only two age categories were distinguished, those below the age of 60 years and those above 60, who were given a triple weight. This setting preserved motivation for risk selection in three ways. First, there were significant differences in premiums depending on the income of individuals; second, multiple differences in average health care costs among age groups were not sufficiently reflected in the risk adjustment; third, very skewed distribution of individual costs within an age group were present. At the beginning of the new millennium, it became clear that VZP, the original insurer, was the loser in this case when some of the other insurers succeeded in attracting, on average, younger and better salaried clients.

From 2004 to mid-2006, a refined risk-adjustment mechanism was gradually implemented, leading to the redistribution of all SHI revenues. This formula combined prospective redistribution based on 36 age-sex risk indexes with retrospective partial compensation of expensive cases. Approx. 10% of SHI revenue was redistributed through this retrospective partial compensation [8]. On an annual basis, an insurer got compensated 80% of individual client's costs exceeding the attachment point (15 times the national average per capita costs). Therefore, the 2004–2006 reform reduced potential of income and age-based risk selection. It also eased impact of extremely expensive cases on individual insurers. However, as shown in Kutzin et al. (2010), motivation to cherry pick healthy clients within age groups remained [8].

3. Health policy processes

The change of risk adjustment during 2004–2006 significantly altered the distribution of revenue among health insurers. The impact resulted mainly from redistributing 100% of collected premiums opposed to the previous amount of 60%. In general, insurers with clients in low-wage industries (including, but not limited to, VZP) benefited from the reform while insurers with clients in high-wage industries (e.g. financial services) lost. Yet, due to long preceding discussions and a phased implementation of the reform over three years all insurers had time to prepare and adapt to the change.

The 2004–2006 reform was initiated and driven by VZP. Unsurprisingly, the Ministry of Health and most political parties agreed to the change (VZP's board of trustees is nominated partly by the Ministry and partly by all parliamentary parties in line with their number of parliament members [1]). Socialists perceived it as an improvement in solidarity and equal access to care, liberals and conservatives as a necessary pre-requisite for a meaningful competition of insurers.

Given the success of VZP in this pooling reform, it continued monitoring developments in risk-adjustment systems abroad (Slovakia, Netherlands) and planned for further refinement in the Czech Republic. Many members of the VZP management level were convinced that VZP was insuring higher share of sick people among its clients than other insurers. Hence, the natural next step would be to risk-adjust for clients' health status. Based on lobbying by VZP and some health policy experts who hoped such change might support development of disease management programs for chronically ill, the modification of risk-adjustment mechanism became part of the Government program in 2010 [9] and then again in 2014 [10].

Already in 2011, the proposal of a new risk adjustment model and related calculations were outsourced by the Ministry to an external advisor. Out of the tools used for risk adjustment in 2010 in other European countries, as described for example by Van Kleef, Van Vliet, and Van de Ven for the Netherlands [11] or Szalayova for Slovakia [12], PCGs were chosen as proxies for chronic conditions. PCGs seemed to the Czech policy-makers to be the most robust, less prone to manipulation and miscoding, feasible in the Czech environment, and with a big potential impact to reflect patients' chronic conditions. Moreover, such risk-adjustment model would fulfil requirements of appropriateness of incentives, fairness, and feasibility as defined by Van de Ven and Ellis [3].

PCGs are defined by consumption of selected pharmaceuticals, e.g. collecting of insulin or oral antidiabetics by a patient from a pharmacy leads to classification of such a patient into a PCG group for diabetes. Fears that definition of PCGs could be manipulated to serve partial interests of individual insurers led to strict adoption of the Dutch PCG classification which was in use in 2012.

Calculations performed by the Ministry's external advisor revealed that chronic patients identified by PCGs were distributed evenly among Czech health insurers. Especially VZP had hoped the risk-adjustment change would boost its revenue by several percentage points. But the calculations estimated its risk-adjusted allocation to increase by just around 0.3%. VZP even commissioned an independent model but it led to similar results. Consequently, VZP minimally supported the initiation of the legislative process which, because of its politically nominated board of trustees, caused a delay in implementing the proposed change. However, the limited impact of the new risk-adjustment model on risk-adjusted allocations also led to less resistance of other insurers. Some of them supported the change.

In 2016, a legislative proposal was finally submitted to the government and the parliament, almost four years after the model design. It was approved without major amendments and discussions and the new risk-adjustment model became valid since January 1, 2018.

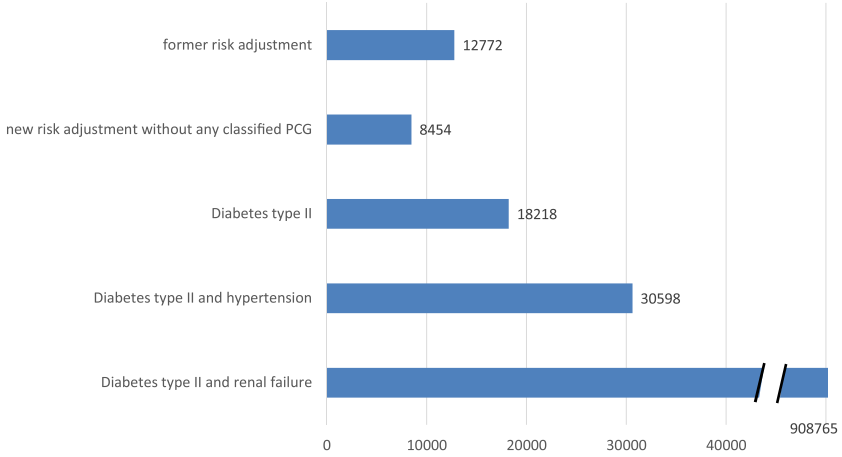

Fig. 1. Insurer's risk-adjusted per capita annual allocation per 40 years-old males with different chronic conditions under the new risk-adjustment mechanism as compared to the former one (in CZK).
Source: Authors' calculation.

4. Content of reform

The Czech model is based on the 2012 Dutch classification of PCGs. It allows for patients to be categorized into more than one PCG. A patient is classified into a PCG in case she has collected from a pharmacy at least a specified amount of defined daily doses (DDDs) of a given pharmaceutical over last 12 months. The Ministry of Health can set the required amounts of DDDs between 121 and 365 DDDs, reflecting the real drug consumption in the Czech Republic. For 2018 the threshold for all PCGs is set at 181 DDDs, like in Slovakia [12]. Patients are reclassified each month, similar to the methodology used in Slovakia [12], while in the Netherlands patients are classified once a year [13,14].

25 PCGs were introduced such as diabetes, depression, transplantation, renal failure and HIV. Risk indexes for 2018 were calculated based on individual-level claims data of the whole Czech population (n = 10.5mill) [15,16]. The full list of PCGs together with their 2018 increments to the age-sex risk indexes are shown in Fig. A in the on-line Appendix. In addition to PCGs, 38 age-sex interacted risk groups are used, the newborns having 2 separate groups. People who do not qualify for any of the PCG have their individual risk index calculated based only on age and sex. The PCG groups are not interacted with age nor sex. Naturally, the pure age-sex risk indexes are lower compared to their values before the PCG introduction.

The 2018 reform also redefined the reinsurance tool. Aiming to stabilize health insurers with smaller population, it strengthened the retrospective risk-sharing among insurers. Rules for retrospective compensation and definition of expensive cases have been changed. Newly, two attachment points, that is thresholds of excessive costs, are defined. The first one equals the sum of a patient's age, sex, and PCG risk-adjusted allocation plus a defined amount set by the Ministry. The reinsurance rate is 80%, i.e. an insurer gets reimbursed 80% of costs of a patient above this point up to the second point. The second attachment point equals the sum of the patient's risk-adjusted allocation plus six times the defined ministerial amount. The reinsurance rate is 95% above this second point.

The proportion of reinsurance relative to the prospective redistribution and the age-sex and PCG risk indexes can be adjusted annually by the Ministry of Health using formulas defined in law. To estimate the risk adjustment model, individual-level administrative data from the previous year, supplied by health insurers for the whole insured population, are used.

The risk indexes are calculated by means of weighted linear regression which is a change from the previous method of weighted averages. A repetitive sequence of regressions is used to incorporate retrospective compensation of expensive cases into the calculations. Thus, the final risk indexes account for the existence and volume of this reinsurance. Fig. 1 illustrates impact of 2018 reform on a particular risk-adjusted per capita allocation. While allocation per a 40 years-old male with no chronic conditions as measured by PCG is by one third lower than the allocation per this male under the former risk adjustment, for males of the same age suffering from chronic conditions the insurer's new risk-adjusted allocation can be a multiple or several multiples of the former one.

The Czech redistribution scheme is zero-sum. Though health insurers do not purchase the reinsurance, they pay an implicit premium for it. Due to the generous retrospective compensation of excessive costs, it may, however, reduce incentives for efficiency and cost-containment and increase free riding incentives, an issue described by many (Van Barneveld [17], Van de Ven and Ellis [3]).

The combination of prospective risk-rating based on 38 age-sex risk groups and 25 PCGs with the strengthened reinsurance compensating retrospectively for expensive cases leads to a high ability of the redistribution model to cover substantial share of differences in individual health care costs. Calculations performed by the Ministry of Health with the 2012 individual-level claim data for the whole Czech population showed the model's predictive accuracy, that is the ability to explain the variation in individual health care costs (after application of reinsurance compensation), measured by the R^2 being 42.53% [15]. Putting these calculations into international context, the results of the very same dataset, but applying the 2012 Slovak risk-adjustment model, which includes risk factors of age, sex, PCGs (allowed for only one, the most expensive, group categorization per person), and insurees' economic activity, indicate Slovak's 2012 model's R-squared being 18–19% [15]. The 2012 Dutch risk-adjustment model included, in addition to the Slovak one but without limiting PCG categorization to only one group per person, also region of residence and previous care consumption other than defined by PCGs, namely diagnosis cost groups related to acute hospitalization, medical devices, physiotherapy and nursing care [11]. Applying this model on the Dutch health insurance scheme for curative care estimates the model's R-squared slightly over 31% [18].

The outstanding performance of the Czech risk-adjustment model is due to imposing reinsurance attachment points while calculating prospective risk indexes. In a repetitive sequence of linear regressions, the ministerial amount is gradually modified with the aim to satisfy policy target for retrospective compensation budget. Consequently, prospective risk indexes are recalculated in every sequence stage. The sequence stops when risk indexes and corre-

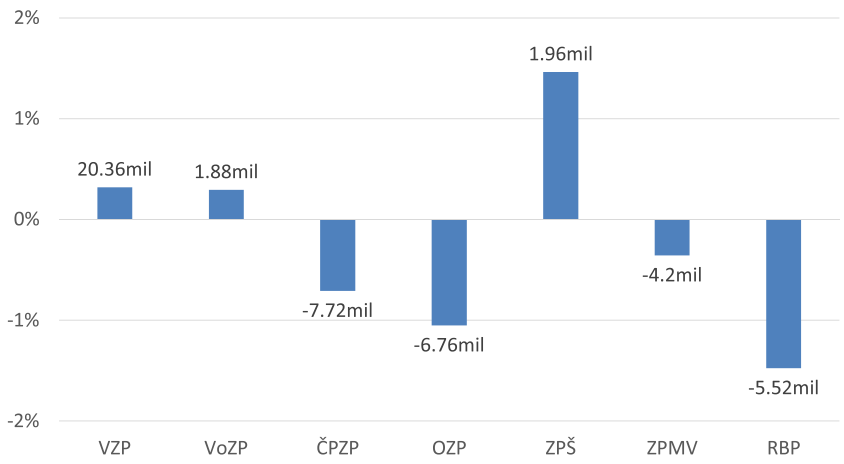

Fig. 2. Changes in individual insurers' annual risk-adjusted allocations due to PCG risk indexes introduction, measured in % (left axis) and in EUR (columns' signs). Source: VZP, 2016 shadow redistribution.

sponding ministerial amount determine the targeted level of all collected revenues to be used for retrospective compensation. Policy target is to use approximately 10% of collected revenues for the retrospective compensation. For 2018 the ministerial amount was set at CZK 206,000 (EUR 8,000).

The retrospective compensation of expensive cases wasn't in use in Slovakia in its 2012 model. In the Dutch case, the retrospective compensation has been gradually replaced by prospective risk factors [13].

5. Expected outcomes

According to data analysis performed before the launch of the new risk adjustment, the inclusion of PCG risk indexes is expected to result only in moderate changes in risk-adjusted revenues of the seven existing health insurers [15]. Since 2015, calculations called shadow redistribution have been performed on an annual basis by VZP that serves as an administrator of redistribution. According to the 2016 results, the highest impact is expected on small regional insurers and roughly equals to 1.5% of their annual revenue. Regarding VZP with its 57% market share, the PCG introduction should result in less than 0.5% change in its revenue [19]. Fig. 2 shows the impact, calculated on 2012 data, of introducing PCG risk indexes on individual insurers as compared to the redistribution based only on age and sex risk indexes. The left axis denotes percentage change in insurers' annual risk-adjusted allocations, columns' legend denotes changes in real terms in EUR. The calculation was performed without the retrospective compensation thus showing the pure PCG effect.

As opposed to the 2004–2006 risk-adjustment reform, impact on insurers' financial balance is not a key characteristic of the current reform. Nevertheless, there are several benefits expected. First, higher attention of insurers paid to chronic conditions and to risk stratification of their clients. Czech policy makers suppose the 2018 reform could support care integration and development of disease management programs as the insurers do not have to fear attracting more clients with chronic (expensive) conditions anymore [15,16]. In this regard, better care organization could be used for cost reduction and at the same time as a client retention tool. Expectations on risk-adjustment reform contribution to better care organization, including disease management programs, are based on examples from neighboring countries (Germany [20], Slovakia [21]). Nevertheless, these should be kept realistic. Introducing PCGs may also lower the incentives for cost-containment through higher risk value of chronic diseases in the redistribution. Insurers are facing smaller losses per each chronic patient than before. Lowering average chronic disease costs also enters calculations of PCG risk indexes in 2 years.

Additionally, better understanding of risk and segmentation of clients could support the move from a health care provider-oriented system to a more client-oriented one. The new risk-adjustment mechanism discloses predictable health risks and

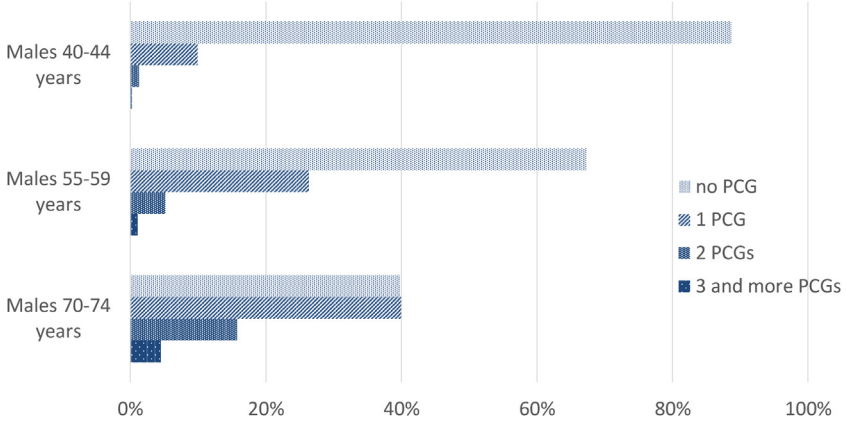

Fig. 3. Share of insurees in different age groups by number of PCG classifications.
Source: Authors' calculation based on unpublished results from research project carried under support No. TD03000209 provided by the Technology Agency of the Czech Republic. Original dataset described by Kucova P., Votapkova J. (2017).

costs associated with chronic diseases. PCG increments to risk indexes serve as proxies for these diseases and make it clear to the insurers and other health care stakeholders what is the combined prevalence of chronic diseases and what is its impact on cost of care. Authors' calculation based on unpublished results from research project No. TD03000209 (original dataset described in Kucova, Votapkova [22]) show that the number of people classified into one or more PCGs increases with age. While among males ages 40–44 years, there are 89% of them without any chronic condition as measured by PCG, 10% of them classified into just one PCG, and only 1% of males classified into two or more PCG groups, males between the ages of 70–74 years has resulted in 40% of them having no chronic condition classification, another 40% suffering from 1 chronic condition according to PCG, 16% suffers from two chronic conditions, and 4% of them having three or more chronic conditions classification. The relationship between age and number of chronic conditions is illustrated by Fig. 3.

Furthermore, the definition of risk included in the PCG model may serve for improvement of payment mechanisms and evaluating quality of provided care. Up to now, only age and sex composition was commonly used by insurers to evaluate risk profile of a population cared for by a provider. For example, the capitation payment to primary care physicians is based on age structure of their registered patients. PCGs may help to evaluate the risk profile in a much more precise way and improve the precision of the capitation tool. Though Czech GPs cannot refuse a patient, inadequate capitation payment in case of chronically ill patients is suspected to lead to lower quality primary health care.

Lastly, the very generous reinsurance rate cuts the tails of excessive individual costs and thus lowers the potential loss per each patient. Macháček (2017) shows the current Czech risk-adjustment system allows for insurers' stable and precise expectation of costs of selected, even relatively small, populations [16]. Therefore, it may support risk sharing arrangements between insurers, providers, and care managers.

Potential limitation of the current risk-adjustment system relates to question whether the Ministry of Health will manage to keep the PCG system up to date. It is necessary to reflect changes in market presence and use of pharmaceuticals. Also, the risk-adjustment system can be further developed and strengthened, and the Ministry of Health should not resign from exploring the possible ways.

Another limitation is potential abuse of reinsurance if free riding advantages are taken. Insurers' behaviour must be closely monitored and all signs inspected. The motivation of insurers to focus on efficiency in health care purchasing significantly decreases when reinsurance attachment points are reached, because further costs are shared in the pool.

6. Conclusion

The Czech risk adjustment reform may be relevant for countries with multiple health insurers as well as for countries applying regional redistribution. Combining prospective risk factors of age, sex, and PCGs with retrospective compensation of expensive cases limits potential losses to manageable level, also for smaller insurers or regions. It reduces motivation to cream skimming based on health status. The 2018 reform thus further levels the playing field for all insurers. It means that a tool has been introduced which allows Czech decision makers - should they decide so on the political level – to increase competition of insurers without fears of substantial motivation to risk selection.

The new risk-adjustment mechanism removes the threat of financial punishment an insurer would sustain in case of attracting more chronically ill people. It is more obvious to the insurers, to the Ministry of Health, and to the public what is the cost of chronic diseases. In this respect, the reform may also facilitate quality of care increase by enabling establishment of disease management programs for PCG-covered chronic conditions, though expectations on cost-containment efforts should be kept realistic. Further to it, increased financial stability of small insured populations may support higher use of risk-sharing contracts with providers of care.

Declarations of interest

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.healthpol.2019.05.017.

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