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The influence of performance-based payment on childhood immunisation coverage

Eero Merilind [a,*], Rauno Salupere [b], Katrin Västra [c], Ruth Kalda [a]

[a] Department of Family Medicine, University of Tartu, Puusepa 1a, 50406 Tartu, Estonia
[b] Klaster Baltic, Gildi 12, 51007 Tartu, Estonia
[c] Estonian Health Insurance Fund, Lembitu 10, 10114 Tallinn, Estonia

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ABSTRACT

Background: Pay-for-performance, also called the quality system (QS) in Estonia, was implemented in 2006 and one indicator for achievement is the childhood immunisation coverage rate. The WHO vaccination coverage in Europe for diphtheria, tetanus and pertussis, and measles in children aged around one year old should meet or exceed 90 per cent.
Methods: The study was conducted using a database from the Estonian Health Insurance Fund. The study compared childhood immunisation coverage rates of all Estonian family physicians in two groups, joined and not joined to the quality system during the observation period 2006–2012. Immunisation coverage was calculated as the percentage of persons in the target age group who received a vaccine dose by a given age. The target level of immunisations in Estonia is set at 90 per cent and higher.
Results: Immunisation coverage rates of family doctors (FD) in Estonia showed significant differences between two groups of doctors: joined to the quality system and not joined. Doctors joined to the quality system met the 90 per cent vaccination criterion more frequently compared to doctors not joined to the quality system. Doctors not joined to the quality system were below the 90 per cent vaccination criterion in all vaccinations listed in the Estonian State Immunisation Schedule.
Conclusion: Pay-for-performance as a financial incentive encourages higher levels of childhood immunisations.

1. Introduction

Almost immediately after independence in 1990, the three Baltic countries began a radical reform of their healthcare [1], dismantling the old polyclinic system and changing the healthcare based on primary care teams [2]. In 2006, Estonia started the pay-for-performance quality system (QS) for family doctors (FD) [3]. The QS is aimed at forcing FDs to pay more attention to prevention and monitoring chronic diseases [4]. Joining the QS is a voluntary process for all FDs and if a FD is joined to the QS, it is a part of the FD's contract. There are no sanctions if a doctor is not joined to the QS.

The prevention domain of the Estonian QS for FDs includes clinical quality indicators for children (0–7 years) as follow-up of the child and immunisation coverage and screening of cardiovascular diseases of 40–60 year old persons. Other domains of the P4P are: monitoring of patients with chronic diseases according to national guidelines: type 2 diabetes, hypertension, hypothyreosis and post-myocardial infarction patients; and providing more comprehensive care: small surgery procedures, PAP

* Corresponding author. Tel.: +372 511 2901; fax: +372 671 0390.
E-mail address: eero.merilind@arst.ee (E. Merilind).

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smears, observation of pregnancy and participation in CME courses for at least 60 h per year. Family doctors fulfilling all this criteria are entitled to extra payment. The pay-for-performance is a part of the QS, to reward excellent outcomes, and consists of 2–4 per cent of the total budget of the FDs.

In Estonia the FD is a private entrepreneur and has an independent contract with the Estonian Health Insurance Fund. The FDs' contract contains different parts: payment per capita, general allowance for equipment and rooms, investigation fund (27–39 per cent of the capitation), fee for distance from the nearest hospital and the QS. Family doctors in Estonia work as gatekeepers to diminish visits to secondary care. Every FD is responsible for the patients in their list, which could be from 1200 up to 2400 patients.

Immunisation represents the most effective and economical tool available in the field of public health. The use of vaccines led to profound changes in the epidemiology of many infectious diseases, reducing their morbidity and mortality [5]. In the European Union, more than 93 per cent of children aged around one year old receive the recommended vaccinations for these diseases [6]. Maintaining high immunisation coverage levels is important to reduce the burden of vaccine-preventable diseases and prevent a resurgence of these diseases, particularly in under vaccinated populations [7].

Some anti-vaccine campaigns and fear of vaccinations, media attention and consequent public concerns about vaccine safety followed publication [8], also resistance of parents and refusal of immunisations can lead to low compliance with vaccinations and low national levels of vaccination targets [9]. In these situations, FDs' attitude and specific provider communication to diminish parent resistance to vaccine recommendations are very important [10].

Immunisations are included in pay-for-performance programmes in several countries [11,12] and financial incentives have shown a stimulating effect on childhood vaccinations [13,14]. Pay-for-performance can be one motivation for FDs to reach higher levels of immunisations and this was the reason why the immunisation coverage rate as an indicator for achievement was included in the QS in Estonia.

The aim of this study was to compare differences in immunisation rates of Estonian FDs in two different groups: those joined to the QS and those not joined.

2. Subjects and methods

All FDs working with the patients lists in 2006–2012 in Estonia were included in the study. Family doctors were divided into two groups according their participation in the QS (Table 1).

Patients' medical data were collected from the Estonian Health Insurance Fund database, which covers 96 per cent of the Estonian population. The database does not cover the data of those who have no medical insurance, but all children in Estonia are covered by state health insurance and therefore were taken as subjects of the study. The database was created on the basis of the health service invoices sent by family physicians. These invoices list all services provided to patients including immunisations and visits to FDs and family nurses, as well as diagnoses according to the ICD-10. The data of service-providing physicians are also included in the health service invoices. All immunisations have a separate code according to state health service price list and are marked on FDs' invoices. Refusals or contraindications to immunisations are also coded and listed in the invoice. Every FD has their own list of patients and the target group for vaccinations is known for the period starting from 1 January and ending on 31 December. To achieve the maximum number of quality points the vaccination target group should be vaccinated according to coverage targets of 90 per cent or higher. We also observed the DTP3 vaccination as indicator to describe the functioning of the health system.

Table 1
Number of family doctors participating and not participating in quality system in 2006–2012 in Estonia.

Year	Quality system	Number	Percentage
2006	Total	797	100.0
	Joined	500	37.3
	Not joined	297	62.7
2007	Total	801	100.0
	Joined	451	56.3
	Not joined	350	43.7
2008	Total	802	100.0
	Joined	643	80.2
	Not joined	159	19.8
2009	Total	805	100.0
	Joined	675	83.9
	Not joined	130	16.1
2010	Total	804	100.0
	Joined	718	89.3
	Not joined	86	10.7
2011	Total	801	100.0
	Joined	756	94.4
	Not joined	45	5.6
2012	Total	799	100.0
	Joined	772	96.6
	Not joined	27	3.4

The Estonian Health Insurance Fund does not provide research data at individual level, only aggregated data, grouped by FD's patient lists, therefore there are limitations for methodological options of data analysis. To examine the data we used the descriptive statistics. The differences between two groups were compared using the non-parametric Mann–Whitney *U*-test; if p was lower than 0.05, the difference was considered statistically significant. Two linear regression models were developed to compare the mean percentage of vaccination coverage of all vaccinations between the two study groups. Data were analysed using the analysing software IBM SPSS Statistics 19.

3. Results

During the observation period 2006–2102 the number of FDs working with patients lists in Estonia was quite stable (797 in 2006, 805 in 2009 and 799 in 2012). In 2006, 37.3 per cent of the FDs were joined to the QS, but in 2012

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