Income-related inequalities and inequities in health care services utilisation in 18 selected OECD countries

Marion Devaux

Abstract A key policy objective in OECD countries is to achieve adequate access to health care for all people on the basis of need. Previous studies have shown that there are inequities in health care services utilisation (HCSU) in the OECD area. In recent years, measures have been taken to enhance health care access. This paper re-examines income-related inequities in doctor visits among 18 selected OECD countries, updating previous results for 12 countries with 2006–2009 data, and including six new countries. Inequalities in preventive care services are also considered for the first time. The indirect standardisation procedure is used to estimate the need-adjusted HCSU and concentration indexes are derived to gauge inequalities and inequities. Overall, inequities in HCSU remain present in OECD countries. In most countries, for the same health care needs, people with higher incomes are more likely to consult a doctor than those with lower incomes. Pro-rich inequalities in dental visits and cancer screening uptake are also found in nearly all countries, although the magnitude of these varies among countries. These findings suggest that further monitoring of inequalities is essential in order to assess whether country policy objectives are achieved on a regular basis.

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Introduction

Most OECD (Organisation for Economic Co-operation and Development) countries have endorsed as major policy objectives the reduction of inequalities in health status and the principle of adequate or equal access to health care based on need. Equity of access is a key element of health system performance in OECD countries [1, 2].

Effective health care coverage provides financial security against expenses due to unexpected or serious illness, and promotes access to medical goods and services. Most OECD countries have achieved universal, or near-universal, coverage of their populations for a core set of health care services. Access to doctor services is ensured at relatively low or no cost for patients. Other services such as dental care and pharmaceutical drugs are often partially covered, although there are a number of countries where coverage for these services must be purchased separately [3]. Preventive screening services for certain cancers such as breast and cervical cancers are generally also available at little or no cost. However, despite these health system features, the utilisation of health care services has been shown to be unevenly distributed across population groups [4–11].

There is already a substantial body of evidence for many countries that inequities—i.e. *inequalities remaining after adjusting for needs for health care*—exist in the use of certain health care services. Previous research on OECD countries in the early 2000s showed that the better-off were

more likely to see a medical specialist, and they often visited these specialists more frequently [4, 5]. Dental care was also used more often by the better-off whereas the picture for general practitioner (GP) visits was less clear-cut, with some evidence for pro-poor inequities. Likewise, European studies using data around the year 2000 confirmed these patterns [6, 7]. Since that time, several countries have introduced policy measures. In particular, one can think of the introduction of a free complementary health insurance coverage for low-income people (called CMU-C) in France in 2000, the extension of public-funded dental care coverage to the whole population in Finland in 2002, the increase in GP supply in deprived areas in England after 2002, the introduction of gatekeeping in Germany in 2004, or the recent implementation of public screening programmes in a number of OECD countries. These new features may have modified access to care and thus it is of interest to re-examine inequalities in health care services utilisation (HCSU) to assess the effectiveness of policy outcomes.

Moreover, although an increasing number of studies pay attention to inequalities in the use of preventive care in the international context [8, 9], to our knowledge, only two studies have focused on gauging these inequalities. The first one covers income-related inequalities in cervical cancer screening in 67 countries (mainly developing countries) [10], and the second one measures inequalities in preventive care treatment in European countries [11]. Our study contributes to this research focusing on both breast and cervical cancer screening and covering a broader set of countries.

This paper aims to re-examine income-related inequalities and inequities in HCSU in 18 OECD countries with 2006–2009 data. It updates previous results for 12 countries from the van Doorslaer and Masseria study [5], and covers six new countries (including New Zealand and five Eastern European countries). The range of health care services includes doctor and dentist visits, and is extended to breast and cervical cancer screening.

This paper contains four sections. After the preceding Introduction, the Section "Data and methods" describes the data and methods used to measure income-related inequalities and inequities in HCSU. The "Results" Section presents results among 18 OECD countries. The "Discussion and conclusions" Section provides a discussion of findings and concludes the paper.

Data and methods

Data on HCSU were taken from national health surveys of 18 selected OECD countries. For most European countries, these came from the European Health Interview Survey (EHIS), which was implemented across countries between 2006 and 2009. For other countries, the most recent national health surveys were used (see Table 1). Although the use of different national surveys for several years might be a source of data heterogeneity across countries, all the variables were constructed in order to get the highest level of comparability.

HCSU variables

Three types of health care services were analysed, these being: (1) doctor visits (separate GP and specialist); (2) dentist visits; and (3) breast and cervical cancer screening services for women. The probability of having a medical visit at least once in the past 12 months is measured for contacts with a doctor and a dentist in all countries (with the exception of dental visits in the past 24 months in France).

National guidelines relating to cancer screening may differ across countries, affecting the inclusion age and frequency of visit. To perform international comparisons, the same age range and frequency were adopted as those used by international research groups [12, 13]. For breast cancer screening, the focus was on women aged 50–69 years who reported having a mammogram in the past 2 years, and for cervical cancer screening, women aged 20–69 years who had a Pap smear test in the past 3 years. The recall period for cancer screening in Ireland referred to the past 12 months.

Table 1 provides the survey name, the sample size, and the probability of HCSU in the 18 countries studied. Further information on the variables of interest is displayed in the web appendix Table A1.

Need-adjustment

Persons in lower socioeconomic groups have higher rates of morbidity, and have greater needs for health care [3, 14]. Doctor, GP and specialist visits are thus adjusted to remove the effect of differing needs for care among persons with different income levels, so that the horizontal equity principle can be tested, as this was previously applied [4, 5].

Let Y be the HCSU and X a set of health care need variables. The indirect standardisation procedure as described in O'Donnell et al. [15] is used to estimate the need-adjusted HCSU, Y^{IS}.

$$Y_i^{IS} = Y_i - Y_i^X + Y_{mean},$$

where Y_i^X, is the need-predicted utilisation and Y_{mean} the sample mean.

The need-predicted HCSU, Y_i^X, i.e. *the expected utilisation if all individuals used health care services on the basis of their needs*, is predicted for each individual

Table 1 List of survey data

Country	Survey data	Population counts	Probability of visiting at least once in the past 12 months					
			Doctor	GP	Specialist	Dentist	Breast cancer screening (in the past 2 years)	Cervical cancer screening (in the past 3 years)
Austria	Österreichische Gesundheitsbefragung 2006/2007 (EHIS)	14,951	n.a.	0.79	n.a.	0.61	0.80	0.82
Belgium	Belgium Health Survey 2008 (EHIS)	4,392	0.86	0.82	0.51	0.58	0.74	0.71
Canada	Canadian Community Health Survey 2007/2008	101,127	0.86	0.77	0.56	0.65	0.74	0.78
Czech Republic	European Health Interview Survey in the Czech Republic 2008 (EHIS)	1,452	0.84	0.73	0.58	0.71	0.67	0.68
Estonia	Estonian Health Interview Survey 2006/2007 (EHIS)	5,833	0.74	0.67	0.47	0.48	0.36	0.30
Finland	Welfare and services Survey (HYPA-survey) 2009	3,916	0.69	0.58	0.40	0.59	n.a.	n.a.
France	Enquête Santé Protection Sociale 2008	10,174	0.91	0.86	0.57	0.75[a]	0.77	0.73
Germany	German Telephone Health Interview Survey (GEDA) 2009	19,765	0.88	n.a.	n.a.	n.a.	n.a.	n.a.
Hungary	European Health Interview Survey 2009 (EHIS)	4,508	0.84	0.76	0.60	0.37	0.65	0.63
Ireland	Survey of Lifestyle, Attitudes and Nutrition in Ireland 2007	8,569	n.a.	0.74	n.a.	0.52	0.33[b]	0.16[b]
New Zealand	National Health Survey 2006–2007	10,629	0.82	0.80	0.33	0.51	0.76	0.74
Poland	Europejskie Ankietowe Badanie Zdrowia 2009 (EHIS)	23,181	0.77	0.71	0.48	0.42	0.59	0.72
Slovak Republic	Europsky prieskum zdravia 2009 (EHIS)	4,113	0.83	0.77	0.55	0.69	0.58	0.61
Slovenia	Anketa o zdravju in zdravstvenem varstvu 2007 (EHIS)	1,528	0.77	0.71	0.46	0.56	0.50	0.78
Spain	Encuesta Europea de Salud 2009	17,253	0.83	0.77	0.53	0.45	0.85	0.79
Switzerland	Swiss Health Survey 2007	14,491	0.79	0.66	0.52	0.65	0.52	0.34
United Kingdom	British Household Panel Survey 2009	11,949	0.79	0.76	0.42	0.69	0.52	0.50
United States	Medical Expenditure Panel Survey 2008	22,611	0.68	n.a.	n.a.	0.42	0.78	0.85

n.a. means not available

[a] Visits in the past 24 months

[b] Visits in the past 12 months

i by regressing the actual utilisation Y_i on a set of need variables on the one hand, and non-need variables which are fixed at the sample mean on the other hand. A logit link function is used for the regression model. The need variables correspond to a range of indicators including age, gender, self-assessed health and limitations in daily activities. Controlling for a range of socio-demographic non-need variables permits accurate estimation of the need-HCSU relationship. We follow van Doorslaer et al. [4, 5] and control for ethnicity, education level, marital status and private insurance status[1] (which may affect the efficiency of health production and the propensity to seek care), and for activity status, region and level of urbanisation (which may affect time price of HCSU). A description of the

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[1] Although the inclusion of private health insurance in the specification of the model may create an endogeneity problem due to selection effect, a sensitivity analysis showed that the findings were robust. We replicated the analysis without including insurance and found that the overall results for the measure of inequities were unchanged.

variables used for the need-adjustment procedure is provided in the web appendix Table A1.

This study also assesses income-related inequalities in dentist visits and breast and cervical cancer screening uptake, however the need-adjustment is not performed for two reasons. First, an annual dental visit being recommended for all persons in most countries, and cancer screening being recommended for women in the targeted age group, one can assume equal needs for preventive care. Second, most data sources do not systematically provide information on needs for curative dental care that technically prevents from adjusting for needs.

Income

Equivalised household income is used as the ranking variable. Data correspond to household total income from all sources after tax and deductions, except in New Zealand and the United Kingdom where income is before tax. Effort is made to equivalise household income with the OECD modified scale in order to account for differences in household size and composition, though the equivalisation procedure somewhat differs across countries due to data limitations. For countries where income is a continuous variable, the equivalised household income is consistently derived (Finland, France, Germany, Spain, Switzerland, UK, and USA). For countries where household income is categorised into brackets or deciles, two approaches are used. If the income brackets mid-points are available, the equivalised income is derived using the mid-point value and the size of the household (Ireland and New Zealand). If not, the equivalised income is derived by crossing data from income categories and the size of the household (Canada and EHIS countries).[2]

Measuring inequalities

The concentration index (CI) is used to quantify the degree of inequality of actual medical care utilisation related to income level by assessing the correlation between the individual's HCSU and the individual's ranking in the income distribution. The CI of a health variable Y can be computed using the simple convenient covariance formula [15]:

$$\text{CI} = \frac{2 \times \text{cov}_w(yi, Ri)}{\mu},$$

where μ is the weighted sample mean of Y, cov_w denotes the weighted covariance and R_i is the relative fractional

rank of the ith individual in the income distribution. The standard errors computed for the CI are robust to heteroskedasticity and autocorrelation [16]. The CI permits gauging of relative inequalities i.e. a positive index indicates pro-rich inequality, a negative index pro-poor inequality and a zero value no inequality. The more the HCSU is concentrated on the most advantaged (most disadvantaged) groups, the higher (lower) is the value of the CI. If HCSU is equally distributed among socioeconomic groups, then the CI is equal to zero.

However, for binary health outcomes, the bounds of the CI depend on the minimum, the maximum and the mean of the health variable. This is potentially problematic for international comparisons when the prevalence of the health outcome varies across countries. To take account of this issue, Wagstaff [17] and Erreygers [18] proposed corrected versions of the CI for binary outcomes. We present in this paper the Wagstaff's index defined as:

$$W = \frac{\text{CI}}{(1 - \mu)},$$

where μ is the weighted mean of the health outcome.[3] All analyses use sampling weights.

This paper deals with the two concepts of inequalities and inequities in HCSU as defined above. In the following sections, the term 'inequity' refers to inequality for need-adjusted HCSU—i.e. for doctor, GP and specialist visits—whereas the term 'inequality' is employed for dentist visits and cancer screening uptake, not adjusted for health care needs.

National health system characteristics

The 18 countries studied in this analysis have different health system characteristics that may affect inequalities and inequities in HCSU. At the time of data collection, around 2006–2009, most of these countries had achieved universal health coverage for their population, except the USA. The share of public and private health financing (including private insurance and out-of-pocket payment) varies across countries, with a large share of private financing in Hungary, Switzerland, and the USA. The share of out-of-pocket payments as percentage of expenditure in dental care measures the financial burden for households; it shows variations from 42 % in Germany to 98 % in Spain. Cost-sharing arrangements for doctor's visits—like free care at the point of delivery in Austria, Canada, Germany, Poland, Spain and UK—are likely to influence equity in

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[2] Detail on the construction of equalised income in Canada and EHIS countries is available on demand.

[3] The analysis was also carried out with the Erreygers index. Results were broadly similar.

Table 2 Health system features

Country	Primary health coverage (% of population), 2009	Public expenditure (% of TCHE), 2009	Private insurance expenditure (% of TCHE), 2009	Private households out-of-pocket expenditure (% of TCHE), 2009	Private dental care expenditure (% total dental care expenditure), 2009	Cost-sharing arrangements, 2012	Primary care physician registration, 2008	Referral to access to specialist care, 2008	Type of provision of care, 2008	Breast cancer screening programme, 2010	Cervical cancer screening programme, 2010
Austria	99	77.2	4.6	17.0	50.3	Mostly free at the point of use for contracted physicians	Not required	Not required	Mostly private	NA	NA
Belgium	99.5	76.0	4.1	19.6	45.7	Per-visit co-payments for outpatient care	Not required	Not required	Mostly private	Nationwide population-based, Free access	Non-population-based
Canada	100	70.3	13.2	15.0	94.6	Free at the point of care	Not required	Required	Mostly private	Population-based but not nationwide, Access with fee	Population-based but not nationwide
Czech Republic	100	83.4	0.2	14.9	49.7	Per-visit co-payments for outpatient care	Not required	Not required	Mostly private	Nationwide population-based, Free access	Nationwide population-based, Free access
Estonia	93.7	78.1	0.2	21.2	51.3	NA	Required	Required	Mostly private	NA	Nationwide population based, NA
Finland	100	74.8	2.2	19.5	55.7	Per-visit co-payments for outpatient care	Not required	Required	Mixed	Nationwide population-based, Free access	Nationwide population-based, Free access
France	99.9	77.6	14.0	7.7	63.9	Per-visit co-payments for outpatient care	Not required	Not required	Mostly private	Nationwide population-based, Free access	Population-based but not nationwide, Access with fee
Germany	100	77.2	9.6	12.3	42.1	Free at the point of care	Not required	Not required	Mostly private	Nationwide population-based, Free access	Nationwide population based (since 2013), Free access

Table 2 continued

Country	Primary health coverage (% of population), 2009	Public expenditure (% of TCHE), 2009	Private insurance expenditure (% of TCHE), 2009	Private households out-of-pocket expenditure (% of TCHE), 2009	Private dental care expenditure (% total dental care expenditure), 2009	Cost-sharing arrangements, 2012	Primary care physician registration, 2008	Referral to access to specialist care, 2008	Type of provision of care, 2008	Breast cancer screening programme, 2010	Cervical cancer screening programme, 2010
Hungary	100	65.5	2.7	25.9	65.1	Per-visit co-payments for outpatient care	Not required	Required	Mixed	Nationwide population-based, Access with fee	Nationwide population-based, Free access
Ireland	100	75.0	NA	NA	N.A.	Free for medical card holders (40 % of pop) and full cost for non-medical card holders.	Not required	Not required	Mixed	Nationwide population-based, Free access	Nationwide population-based, Free access
New Zealand	100	83.0	5.0	10.6	65.7	Cost-sharing for outpatient primary care, no cost-sharing for specialist care	Not required	Required	Mixed	Nationwide population-based, Free access	Nationwide population-based, Free access
Poland	97.6	71.7	0.6	24.4	64.0	Free at the point of care	Not required	Required	Mostly private	Nationwide population-based, Free access	Nationwide population-based, Free access
Slovak Republic	95.2	69.2	0.0	26.9	55.3	NA	Required	Required	Mostly private	Non population-based, Free access	Non-population-based, Free access
Slovenia	100	72.9	13.5	12.7	49.2	Cost-sharing	Required	Required	Mixed	Population-based but not nationwide, Access with fee	Nationwide population-based, Free access
Spain	99.2	74.3	5.9	19.5	98.5	Free at the point of care	Required	Required	Mostly public	Nationwide population-based, Free access	Population-based but not nationwide, Access with fee

Table 2 continued

Country	Primary health coverage (% of population), 2009	Public expenditure (% of TCHE), 2009	Private insurance expenditure (% of TCHE), 2009	Private households out-of-pocket expenditure (% of TCHE), 2009	Private dental care expenditure (% total dental care expenditure), 2009	Cost-sharing arrangements, 2012	Primary care physician registration, 2008	Referral to access to specialist care, 2008	Type of provision of care, 2008	Breast cancer screening programme, 2010	Cervical cancer screening programme, 2010
Switzerland	100	65.5	8.8	24.7	93.3	Cost-sharing after general deductible	Not required	Not required	Mostly private	Population-based but not nationwide, Free access	Non-population-based, Free access
United Kingdom	100	84.1	NA	NA	N.A.	Free at the point of care	Not required	Required	Mixed	Nationwide population-based, Free access	Nationwide population-based, Free access
USA	81.3	47.7	35.5	12.5	90.8	NA	Required	Required	Mostly private	Non population-based, Access with fee	Non-population-based, Free access

NA not available. The total current health expenditure (TCHE) comprises public expenditure, private insurance, household out-of-pocket as well as non-profit institutions serving households and corporations (other than health insurance)

Source OECD Health Statistics 2013 [13]; Author's information based on OECD health system characteristics surveys 2008 and 2012 [19]; OECD, 2013 [20]

access to health care. Countries with strengthened primary care organisation and a gatekeeping system may provide simpler access and better guidance for people in lower socio-economic positions. A gatekeeping system is in place in Estonia, the Slovak Republic, Slovenia, Spain and the USA, through a compulsory registration to a primary care physician and a required referral to access specialist care. Organisational features such as the type of health care provision—mostly private in 11 countries—and the existence of public screening programmes may also play a role in access to care. Free nationwide population-based screening mammography programmes operated in 2010 in Belgium, the Czech Republic, Finland, France, Germany, Ireland, New Zealand, Poland, Spain, and the UK (not nationwide in most of the other countries). Pap smear tests are available through free nationwide population-based programmes in the Czech Republic, Finland, Germany, Hungary, Ireland, New Zealand, Poland, Slovenia, and the UK.[4] Data on health system characteristics presented in Table 2 refer to the years 2008–2012 and come from OECD data sources [13, 19, 20]. We refer to these cross-country differences when interpreting the study findings.

Results

Inequities in need-adjusted doctor visits

Figure 1 shows income-related inequities in the probability of a doctor visit after adjusting for individuals' needs for health care. The inequity index is significantly greater than zero in 14 out of 16 countries, indicating that for the same level of needs for health care, people with higher incomes are significantly more likely to visit a doctor than those with lower incomes. The magnitude of these inequities varies among countries, with the USA displaying the largest inequities followed by France, Poland and Canada. In contrast, the Slovak Republic, Spain and Switzerland show a lower degree of inequities. At the other end of the spectrum, the UK presents an inequity index which is not statistically different from zero, indicating that no inequities can be detected. This is also the case for the Czech Republic, although the small sample size in the Czech Republic limits the ability to detect significant effects. The degree of inequity is the highest in USA, where universal health primary coverage was not achieved. Beyond primary coverage, the role of private health insurance is of importance. The USA, France and Canada, which present large inequities, are characterised by a large share of private insurance expenditure (as shown in Table 2). Larger inequities are found in countries where the provision of
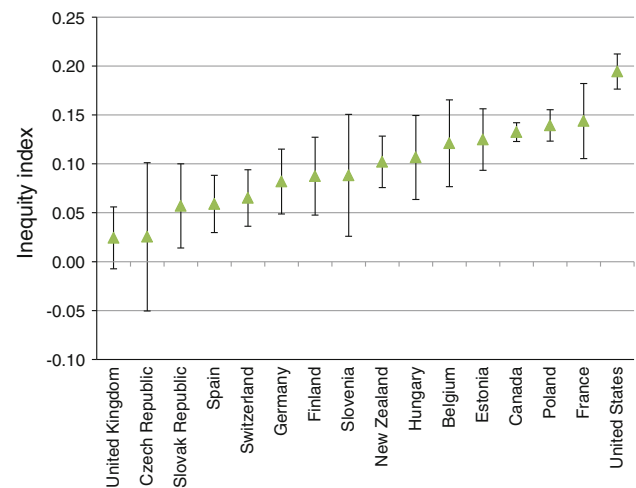

Fig. 1 Inequity index for the need-adjusted probability of a doctor visit and its 95 % confidence intervals

care is predominantly private (the USA, France, Poland, Canada, Estonia, and Belgium), although this is also true in the Czech and Slovak Republics, Switzerland and Germany. Virtually no inequity is found in the UK where outpatient primary and specialist care is free of charge at the point of delivery. Similar settings are in place in Spain and Germany[5] where inequities are small, but also in Canada and Poland where inequities are larger, suggesting that other features may influence inequities in doctor visits.

Inequities in need-adjusted GP and specialist visits

Figure 2 presents income-related inequities in GP and specialist visits after adjusting for individuals' needs for health care. Nine out of 16 countries display significant inequities in GP visits (Fig. 2, panel A). The largest inequities are observed in Canada, Poland and New Zealand. Conversely, seven countries present no significant inequities, indicating that people with lower incomes are as likely as those with higher incomes to consult a GP. Germany and the USA do not present data split by GP and specialist. The largest inequities in GP visits are found in New Zealand where the average cost-sharing for an outpatient primary care physician contact is about 30 %, with a range of co-payments depending on practice type and patient status. In contrast, smaller inequities are observed in countries providing free care at the point of delivery (Spain, Austria, and the UK) or with a small co-payment of about 1 euro per visit (Czech Republic and Hungary).

The variation of inequities in specialist visits among countries (Fig. 2 panel B) is larger than that of inequities in GP visits, and the pattern is also clearer. In all countries but

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[4] Only in England, Scotland and Wales.

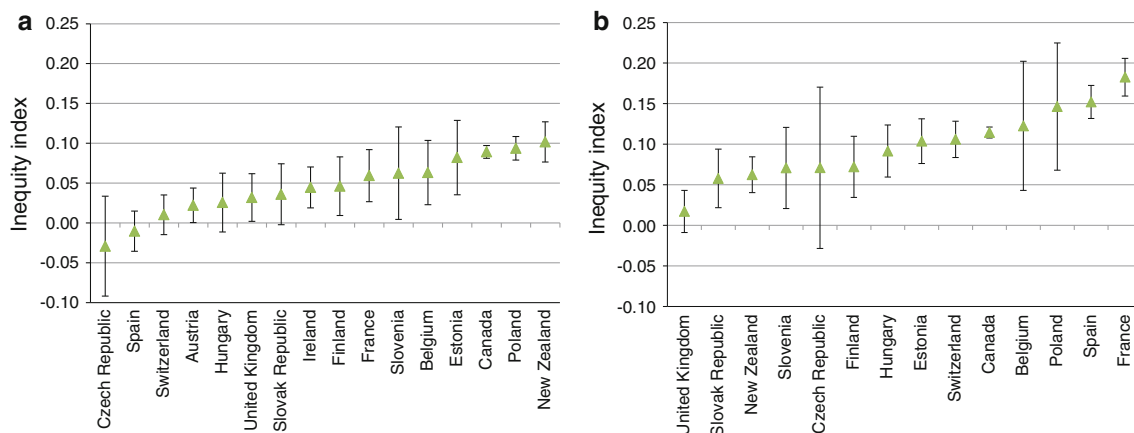[5] For people with statutory health insurance.

Fig. 2 Inequity index for the need-adjusted probability of a GP visit and a specialist visit, and its 95 % confidence intervals. **a** GP. **b** Specialists

two, the inequity index is significantly greater than zero, which means that for the same needs for health care, people with higher incomes visit specialists more often than those with lower incomes. In particular, France and Spain display the largest inequities. On the other hand, no inequities can be detected in the UK (and in the Czech Republic, due to the small sample size) and low degrees of inequities are found in the Slovak Republic, New Zealand[6] and Slovenia. These three countries, as well as the UK, are characterised by the fact that GPs act as gatekeepers and a referral is required to get access to specialist care. However, this is also true in Spain which has the second highest degree of inequities in specialist visits. Beyond that, the distinction between public and private sectors has its importance since inequities in specialist visits in Spain were found mainly in the private sector [21].

Inequalities in dentist visits

Figure 3 shows that all countries display significant income-related inequalities in dental visits. The extent of these inequalities varies greatly among countries. Canada and the USA stand out with the strongest inequalities that are more than 3 times the degree of inequalities observed in Switzerland. The two countries with the strongest degrees of inequality are characterised by a large share of private expenditure for dental care (95 % in Canada and 91 % in USA). This is also true in Spain (99 %), France (64 %), and Poland (64 %) where inequalities in dentist visits are large. However, Switzerland also presents a high share of private expenditure for dental care (93 %) but has the lowest level of inequality. This suggests that other institutional factors play a role on inequalities in the use of
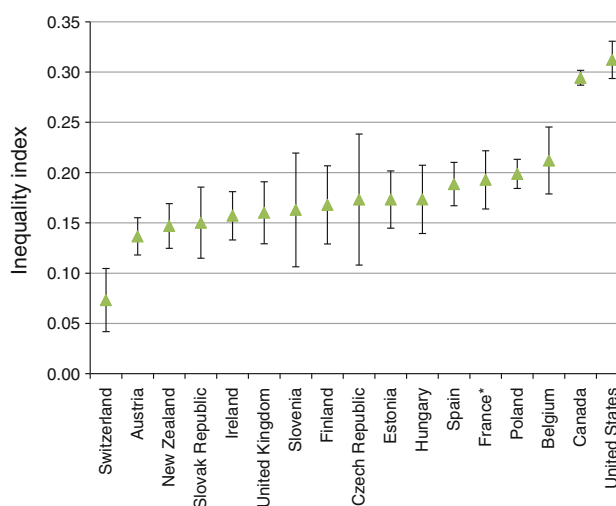

Fig. 3 Inequality index for the probability of a dental visit and its 95 % confidence intervals. *Note* *Visits in the past 24 months in France

dental care such as exemptions of co-payments for certain groups of the population.

Inequalities in cancer screening

Figure 4 presents income-related inequalities in breast and cervical cancer screening (panels A and B). Inequalities in breast cancer screening in favour of the better-off are shown in 12 out of 16 countries. The largest inequalities are observed in Belgium, Estonia, France, and the USA. In contrast, no inequalities can be detected in four countries (the Czech Republic,[7] the Slovak Republic, Slovenia and the UK). Inequalities in cervical cancer screening are shown in all countries but two. The degree of these

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[6] In New Zealand, specialist visits, in contrast to GP visits, are exempted from co-payments.

[7] The small sample size in the Czech Republic and Slovenia prevents detection of significant differences.
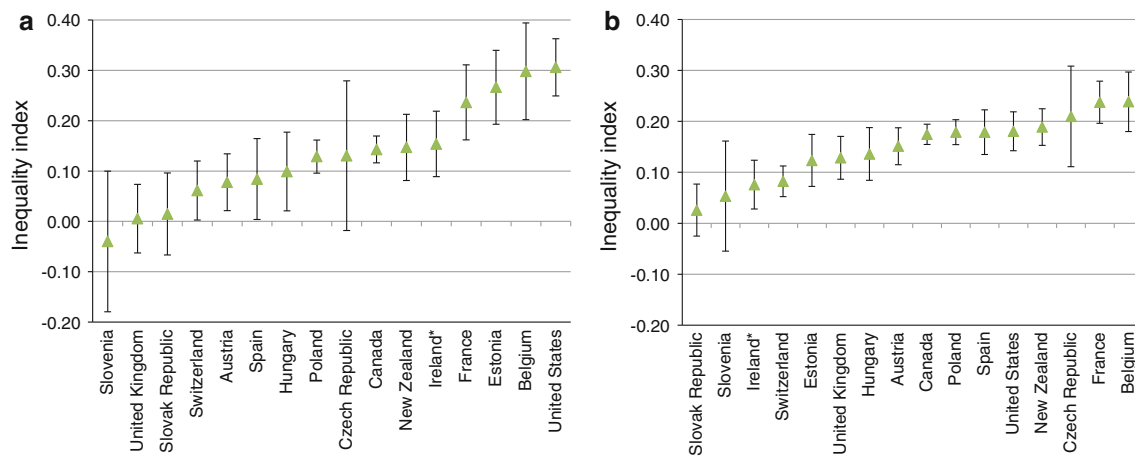
Fig. 4 Inequality index for cancer screening and its 95 % confidence intervals. **a** Breast cancer. **b** Cervical cancer. *Note* *Visits in the past 12 months in Ireland

inequalities varies from below 0.10 in Ireland, the Slovak Republic, Slovenia, and Switzerland to more than 0.20 in Belgium, the Czech Republic and France.

Inequality in cancer screening must be interpreted with regards to the level of cancer screening rates (displayed in Table 1). Breast cancer screening rates are high in Austria, France, New Zealand, Spain, and the USA, with more than 75 % of women aged 50–69 years having had a mammogram in the past 2 years. At the other end of the spectrum, in Estonia, only 36 % of women had a mammogram in the past 2 years. Similarly, cervical cancer screening rates are high in the USA, Austria, Spain, Slovenia, and Canada, with more than 75 % of women aged 20–69 years having had a Pap smear test in the past 3 years, whereas this proportion is only 34 % in Switzerland. The Wagstaff index used in this study already makes the adjustment for differences in the national average rate of screening, giving a higher weight to the countries with larger screening coverage. A country with a small degree of inequality and a wide screening coverage may count as much as a country with large inequalities and a small population coverage. This is the case for instance in Estonia and Belgium. Estonia has a large degree of inequality in breast cancer screening (crude CI 0.17) but a small proportion of screening uptake (36 %). In comparison, Belgium has a smaller degree of inequality (crude CI 0.08) and a larger screening rate (74 %). After adjustment for the level of screening rate, the Wagstaff inequality indexes are 0.27 in Estonia and 0.30 in Belgium.

The utilisation of cancer screening services may largely depend on the availability of national public screening programmes. For instance, recent findings in the European region highlight that inequalities are larger in countries without a population-based screening programme [8]. In our study, the degree of inequality in cancer screening has been examined in the light of the existence of national screening programmes, however we do not find any clear association. Beyond the existence of screening programmes, the lack of association may be related to the time since programmes were rolled out. Another explanation relies on the fact that screening is often fully covered by insurance in most countries [20, 22]. A recent study shows that the impact of the availability of national programmes on screening uptake is mediated to a minor extent by solving financial restriction, and to a large extent by preventing women from considering screening unnecessary [23].

Reasons for cancer screening uptake depend not only on national institutional features but also on individual characteristics. Ethnicity, younger age, higher education level, employment status, residential area, marital status, having health insurance, good health status, having a usual source of care and use of other preventative services, are all recognized as important additional predictors of participation in screening. For instance, in the United States, low-income women, women who are uninsured or receiving Medicaid (health insurance coverage for the poor, disabled or impoverished elderly), or women with lower educational levels report much lower use of mammography and Pap smears [24]. Similarly, in European countries, significant inequalities related to education and socioeconomic status are found in the utilisation of early detection and preventive health care services [25, 26].

Discussion and conclusions

Since inequities in HCSU were first assessed across OECD countries around the year 2000, governments have prioritised equity of access and made health system features

evolve. This study shows that a decade later, income-related inequalities and inequities in HCSU remain existent in OECD countries. In the majority of countries, for the same needs for health care, people with higher incomes are more likely to consult a doctor—in particular, a specialist—than their counterparts with lower incomes. Inequalities in dental and preventive care are also found in most countries, if not all. The magnitude of these inequalities varies considerably among countries. Results show larger inequalities in France and the USA. In particular, the USA presents the strongest inequalities in doctor and dentist visits. France displays the largest inequalities in specialist visits and among the largest inequalities in doctor visits and cancer screening. On the other hand, inequalities are generally smaller in Switzerland (notably in dental and preventive care), and the UK (in doctor and specialist visits, and breast cancer screening).

These results are consistent with the literature [4–7]. Recent findings on European data highlight that inequities in specialist visits are the highest in France and Spain [6, 8]. Regarding dental care services, inequalities in favour of the better-off are found consistently in a large number of countries [27].

Part of the cross-country discrepancies can be explained by the differences in health system characteristics. In particular, larger inequities are found in countries where: universal health coverage is not achieved, health care financing relies on a large share of private insurance and out-of-pocket payments, GPs do not act as gatekeepers, health care provision is mostly private and national cost-sharing arrangements do not include free care at the point of delivery.

Comparisons with the previous study around the year 2000 [5] cannot be directly made because different types of index were employed, our study using the Wagstaff index, a more appropriate index for international comparisons. Results obtained with the exact same methodology as the one previously used (not displayed herein) suggest that overall, inequities and inequalities have remained stable over time, despite a few exceptions. The country ranking and the size of inequities are reasonably consistent, especially for doctor and GP visits. Some differences in surveys and in wording of questions may affect comparisons, in particular for specialist visits in Finland and France, and for dentist visits in Ireland and Spain, but only to a small extent (detailed results available in [28]). Comparisons over time could be undertaken with more rigorous techniques like the Oaxaca-type decomposition of change in CI [29]. However, this requires access to and harmonisation of survey data of several past years. This was not in the scope of this study but it could be performed in future developments.

This study offers new information on income-related inequalities in HCSU and it presents, for the first time, a cross-country comparison of the degree of inequalities in breast and cervical cancer screening. However, this paper has several limitations. First, this study could not separate public from private health care services, whereas some evidence suggests that different patterns exist. Inequities in specialist visits are shown to occur largely in the private sector in Spain, while the public health system is more equitable [21]. Similarly, inequalities in dental care utilisation are found to vary between public and private services in Finland [30]. Second, this study considers dental visits as a whole since the data cannot distinguish between curative and preventive dental care. However, results may differ across both types of care, preventive dental care being associated with larger inequalities [27, 31]. A third limitation is related to the appropriateness of the definition of health care needs. In this study, health care needs include self-assessed health status which is widely regarded as a good predictor of both health care utilisation and mortality [32, 33]. Health care needs also include objective health indicators like limitations in daily activities. Health care needs do not include any measure of morbidity, although this adjustment was shown to have its advantages [34]. Morbidity as reported in national health surveys is subject to a high heterogeneity in individual responses. For instance, people who report chronic diseases are more likely to be those with sufficient health information, being in contact with doctors, and potentially with higher incomes. The adjustment for morbidity as reported in surveys may thus bias the measurement of socioeconomic inequalities in health [35]. Recently, methodological improvements show that assuming homogeneity in the relationship between need and use of care tends to underestimate pro-rich inequity [36]. These further improvements could be applied in future studies once the limitations of objective health measures have been handled. Last, the income variable was derived on the basis of the survey data available. A lot of effort was made to equivalise household income and to get data harmonised across countries despite differences and limitations in data sources. A sensitivity analysis for the use of income confirms the robustness of our findings. We replicated the analysis by using (not equivalised) household income and found consistent results.

This paper suggests that further monitoring of inequalities in HCSU is essential in order to assess whether country policy objectives are achieved on a regular basis. The findings highlight that inequalities and inequities in HCSU have remained present over time in the studied period in OECD countries despite developments of health care systems. However, more recent reforms are expected to lead to changes in access to care, like the extension of

primary health coverage in the USA, the introduction of exemptions of co-payments and up-front payments for vulnerable populations visiting GPs in Belgium in 2011, and the suppression of co-payments for GP and specialist visits in Germany in January 2013. Future studies could examine the impact of these specific health reforms on equity in health care access.

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