

BMJ Open Second opinion utilization by healthcare insurance type in a mixed private-public healthcare system: a population-based study

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ABSTRACT

Objectives To evaluate the utilisation (overall and by specialty) and the characteristics of second-opinion seekers by insurance type (either health fund or supplementary insurance) in a mixed private-public healthcare.

Design An observational study.

Setting Secondary care visits provided by a large public health fund and a large supplementary health insurance in Israel.

Participants The entire sample included 1 392 907 patients aged 21 years and above who visited at least one specialist over an 18 months period, either in the secondary care or privately via the supplementary insurance.

Outcomes measures An algorithm was developed to identify potential second-opinion instances in the dataset using visits and claims data. Multivariate logistic regression was used to identify characteristics of second-opinion seekers by the type of insurance they used.

Results 143 371 (13%) out of 1 080 892 patients who had supplementary insurance sought a single second opinion, mostly from orthopaedic surgeons. Relatively to patients who sought second opinion via the supplementary insurance, second-opinion seekers via the health fund tended to be females (OR=1.2, 95% CI 1.17 to 1.23), of age 40–59 years (OR=1.36, 95% CI 1.31 to 1.42) and with chronic conditions (OR=1.13, 95% CI 1.08 to 1.18). In contrast, second-opinion seekers via the supplementary insurance tended to be native-born and established immigrants (OR=0.79, 95% CI 0.76 to 0.84), in a high socioeconomic level (OR=0.39, 95% CI 0.37 to 0.4) and living in central areas (OR=0.88, 95% CI 0.85 to 0.9).

Conclusions Certain patient profiles tended to seek second opinions via the supplementary insurance more than others. People from the centre of the country and with a high socioeconomic status tended to do so, as medical specialists tend to reside in central urban areas. Further research is recommended to examine the availability of medical specialists by specialty and residence.

INTRODUCTION

The role of private-public mixed (PPM) healthcare systems in the development and operation of healthcare services has recently

Strengths and limitations of this study

- This study presents a large-scale population analysis based on an innovative algorithm.
- This study is based on an innovative linkage between rarely linked datasets: universal insurance data and supplementary insurance, containing data on private consultations.
- All previous studies that evaluated second-opinion utilisation used self-reported surveys with relatively small samples.
- Lack of data from private health insurances.

drawn interest from researchers and policy makers, as the private sector affects and shapes the public sector and vice versa.¹ Some countries in the USA and Europe adopted public-private partnerships, mainly in order to cope with growing healthcare expenditures, especially those of the private health system.^{2,3} Most of these partnerships maintain clear boundaries between the public and the private sector. Yet, in some countries having PPM, these boundaries are not always clear in aspects of funding and provision (eg, in Israel and the Netherlands). The lack of clarity between private and public may increase inequalities, especially when certain services are available only for those who are able to purchase them privately by out-of-pocket payments.

Healthcare organisations have an important role in reducing health inequalities caused by access to quality medical care among other things.^{4,5} One of the debates in countries having PPM and National Health Insurance (NHI) is what services should be provided by the NHI, bearing in mind that national tax-funded baskets are limited in their budgets and services.^{6–8} Moreover, how to provide a service within a funded basket without creating overuse becomes

a challenge, including controversial literature on what is proper use of healthcare services. A recent initiative called Choosing Wisely, promoted in various countries, seeks to advance a national dialogue on avoiding unnecessary medical tests, treatments and procedures.⁹

Consultations with specialists can serve as an example for such a service in question, since different policies were implemented by various countries having NHI: France and Japan, entail high copayments for specialists in order to avoid overutilisation while other countries, such as Great Britain, limit copayments for specialists. In Great Britain, choice of specialists is limited and long waiting lists for specialists have become a serious problem.¹⁰ In order to cope with these problems, Great Britain offers a supplementary free-market private health insurance.¹¹

One typical use of consultation with specialists is for getting a second opinion (SO). Previous studies have shown the clinical importance of SOs, especially in light of discrepancies in clinical judgement,¹²⁻¹⁷ and their potential to reduce unnecessary surgical procedures,¹⁸⁻²² which may lead to reduced costs. There are three main types of SO: the most common type of SO is initiated by patients to consult with another physician for an additional opinion on a diagnosis, treatment or prognosis,²³ this study focuses on the first type. The second type, initiated by the physician, who is looking for the advice of a second specialist. The third type, related to SO programmes usually imposed, on patients and doctors alike, by third-party insurers as a cost containment measure.¹¹

Exploring SO utilisation by healthcare insurance type can serve as a case study for understanding the PPM in healthcare and its influence on the development and operation of SOs. Moreover, differences in access to healthcare services such as SO can also explain health inequalities, especially when it comes to paying out of pocket.

Second opinion utilisation by healthcare insurance in the world

There are major differences among countries in health policy, regulatory arrangements and insurance types, which define access, provision and payment mechanisms for SOs.

In the last decades, SOs evolved from an insurer requirement derived from financial considerations to a patient's right^{24 25} and many patients are likely to obtain an SO, especially on serious diagnoses.²⁶ A debate still exists whether SOs are a right or a concession and how insurers should cover them.

In a market characterised mostly as private such as the US, SOs in many cases serve as a cost control tool, where health insurance plans require and provide mandatory SOs for surgery. SO programmes were first introduced in the US in the 1970s by insurance companies as a pre-authorisation tool before elective surgery.²⁷

The Medicare Health Maintenance Organisation (HMO), which covers about 13% of the population, provides SOs in some cases before surgery with copayment

and will pay 80% of the cost. Some plans in the US require a referral from the primary care physician and require seeing an in-network physician.²⁸ Conversely, in countries having NHI such as Canada, there is no mandatory SO requirement for surgery²⁹ and in some other countries in Europe it is not a formal right. For example, in the UK, patients do not have a legal right to an SO, although a healthcare professional will rarely refuse to refer them for one.³⁰ Only few studies examined the characteristics of patients seeking an SO by insurance type or coverage policy. The only finding relating to insurance type shows that among HMO enrollees with private insurance, the odds of getting an SO were 2.7 times greater than they were for HMO enrollees with public insurance.²⁵ Another study reports that one of the only predictors of remaining at the SO site was insurance type.³¹

Second opinion in the Israeli healthcare system

In Israel, patients are legally entitled to obtain SOs according to the Patient Rights Law (1996), but there is no government coverage for this entitlement in the NHI Law (1995) or in any other laws.

The Israeli healthcare system consists of four non-profit health funds providing primary and secondary care. The health funds also provide supplementary health insurance services that demand extra payment, based mainly on age (in contrary to NHI, funded by health taxes). Seventy-five per cent of Israelis had supplementary health insurance services by 2011.³² The supplementary insurance provides complementary services (eg, complementary medicine, cosmetics) and supplementary services (eg, SO, choice of physicians, etc) that are not included in the national public basket.^{3 33}

With respect to SO, patients in Israel can in practice obtain SOs in three ways.

First, patients can obtain SOs through the supplementary health insurance programmes. Patients are eligible to partial reimbursement for out-of-pocket SO consultations with private specialists (up to 80% of the out-of-pocket cost, limited by the upper bound of approximately US\$130 per consultation. The cost of a private consultation typically ranges between US\$200 and US\$500). This reimbursement is quite similar across the four health funds. The supplementary health insurance offered by 'Clalit Health Services' (the largest health fund in Israel), also provided a unique service called 'consultants network', which allowed to consult with specific specialists (who work under contract with the health fund) for SO and pay a copayment of ~US\$33 (updated to 2011, as of this study period) directly to the consultant. SO consultations through the supplementary health insurance programmes are limited up to a maximum of three per calendar year.

Second, patients can get an SO through the private sector and pay out-of-pocket and receive a partial reimbursement by private insurance companies.³⁴

Third, patients can get an SO through the secondary care provided by the health funds themselves. Although

SO is not included in the basic basket, patients can approach specialists working in the community by paying (approximately) a US\$6 quarterly copayment for the same specialist for a 3 months period, with no limitation on the number of visits.

In this paper, we focus on the first and third insurance types (the supplementary health insurance and the health fund), as it is much more complicated to obtain data from private insurance companies (there is a large number of such companies, and each company store the relevant information in a different format).

It is not clear how many SOs are funded by each of these two sources, which differ substantially in their equity implications, and what are the characteristics of the SO seekers in each case. Moreover, it is important to explore whether there exist such differences between the two insurance types in specific specialties, which may indicate differences in supply of services between the two insurance types in these specialties.

The need to better understand these aspects becomes even stronger due to the sharp increase in demand for SOs in Israel via the supplementary health insurance programmes and the increase in their total net expenditure by >50% from 2006 to 2010.³⁵ This rise reflects the shift from pure private encounters to a private-public mix characterising the supplementary insurance environment.³

To the best of our knowledge, all studies that evaluated SO utilisation so far were based on patient self-reported surveys and not on objective data, which makes it difficult to compare among different studies and countries. A recent systematic review stresses the need for standardised methods and outcome measures.³⁶ The lack of objective data on SO utilisation by insurance type drove us to conduct a quantitative measurement of SO utilisation in a large-scale population.

Objectives

To evaluate the utilisation (overall and by specialty) and the characteristics of SO seekers by insurance type (either health fund or supplementary insurance) in a mixed private-public healthcare.

METHODS

Data sources

This study is based on the same data used in the study by Shmueli *et al.*³⁷ which was provided to us by 'Clalit Health Services'. Clalit Health Services is the largest health fund in Israel, covering 52% of the Israeli population (>4.5 million, second largest in the world after Kaiser Permanente) and providing primary, secondary and tertiary care. We used two datasets which were linked by a patient identifier and by a physician identifier (health fund; supplementary insurance services) in order to analyse: (1) consultations with specialists in the community secondary care and (2) claims of out-of-pocket costs of private consultations, claimed from the

health fund's supplementary insurance services. The datasets also included patient demographics.

Study population

We applied the same inclusion and exclusion criteria that were used in the study by Shmueli *et al.*³⁷ The inclusion criteria were: (1) being an active member of 'Clalit Health Services' (active between 1 September 2009 and 30 April 2011); (2) age 21 years and above; (3) visited between 1 September 2009 and 30 April 2011 at least one specialist, either in the secondary care provided by the HMO in the community, or a private consultation claimed from the HMO's supplementary insurance services, in one of the following domains: orthopaedics, ophthalmology, dermatology, ear, nose and throat (ENT), cardiology, general surgery, urology, gastroenterology and neurology. We chose these specialties following a preliminary descriptive analysis, showing that these domains account for the vast majority of consultations. The exclusion criteria were: (1) patients who only visited a family physician; (2) patients who did not consult with a specialist in the above list; (3) treatment or medical procedure visits (ie, non-clinical consultations) and (4) patients who died during the study period.

Variables and measurements

We defined a 'second medical opinion' instance as 'consulting with another specialist, in the same specialty, within 3 months of the first consultation in order to get an SO for the same medical problem'.

Since our dataset did not have an explicit field indicating whether a visit to a physician constitutes an SO or not, we applied a dedicated algorithm to identify SO instances. The algorithm was first suggested by us in the study by Shmueli *et al.*³⁷ and was used there to evaluate SO utilisation rates. A detailed description of the algorithm as well as a running example illustrating the main stages of the algorithm (figure 1) are shown in online supplementary appendix I.

Each SO instance identified by the algorithm includes a pair of visits—the first consultation of a patient with a specialist (the 'first opinion') and a consultation with another specialist (the 'second opinion'). Each 'pair' of a first opinion and an SO could take place in four possible combinations: (1) both first opinion and SO provided via the health fund; (2) both first opinion and SO provided via a supplementary insurance; (3) first opinion provided via the health fund and SO via the supplementary insurance; (4) first opinion via the supplementary insurance and SO provided via the health fund.

The dependent binary variable was the setting where the SO was obtained. It could be at the community secondary care provided by the health fund, or a private consultation claimed via the supplementary insurance.

The covariates included patient demographics: (1) age; (2) gender; (3) being an immigrant (defined as immigration to Israel after 1989, the years of mass immigration mainly from the former USSR); (4) socioeconomic level

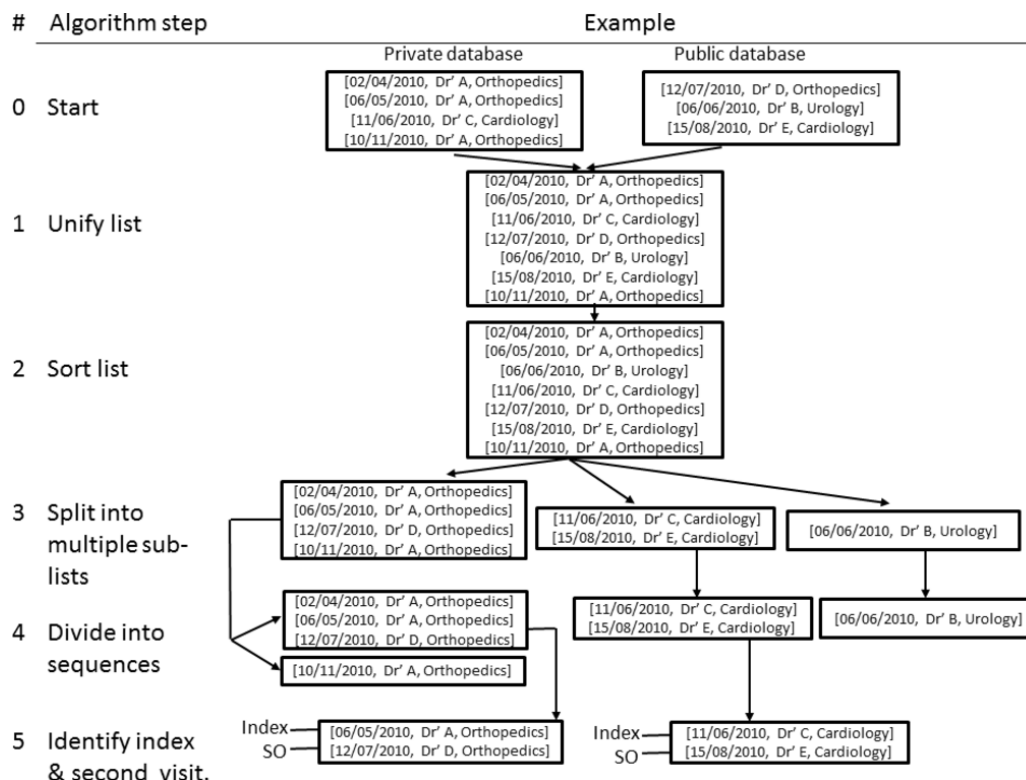


Figure 1 A time-sensitive algorithm for identifying second-opinion consultations.

(according to the Israeli Central Bureau of Statistics). We clustered the original 10 groups of socioeconomic levels, grouped into three levels: low, medium and high; (5) Charlson Comorbidity Score (without age)—the most widely used clinical index for the evaluation of comorbidities. The score is based on a weighted index that considers the seriousness of a comorbid disease. Scores were grouped into four levels: 0, 1–2, 3–4 and >5³⁸; (6) ‘periphery’ level. The ‘periphery’ level (according to the Israeli Central Bureau of Statistics) is based on a peripheral index which combines two components: potential accessibility index of the local authority and proximity of the local authority to the boundary of the Tel Aviv district (www.cbs.gov.il). The peripheral index included local authorities that were classified into 10 clusters. We grouped those clusters based on their periphery distribution scale into three groups: peripheral, intermediate and central.

Statistical analyses

Descriptive statistics of the independent variables were calculated for the overall population of members who had sought one SO. We then compared the characteristics of patients who sought an SO from a physician through the health fund with those who sought an SO through the supplementary insurance using univariate χ^2 tests. We applied the procedure suggested by Kraemer *et al*,³⁹ to reduce the level of collinearity in the model and consequently to prevent misinterpretations of the fitted model’s results. More specifically, we checked correlations between each pair of variables, and excluded the religion

variable as it was found to be highly correlated with the socioeconomic variable ($r=-0.599$). A multivariate logistic regression model was examined as an adjusted full model to assess the association between SO seeking by insurance type and the covariates. We created dummy variables for all of the categorical variables (age, socioeconomic level and Charlson Comorbidity Score). We entered into the multivariate logistic regression only variables that were significant ($p<0.05$) in the univariate tests. We used the ENTER elimination method for model selection. The threshold for elimination was 0.05. We used SPSS V.23 for the statistical analyses.

Patient involvement

Since this study is based on the analysis of electronic medical records and is not a clinical research, patients were not involved at any stage of the study.

FINDINGS

The total number of patients included in our dataset was 1 392 907 (figure 2). Out of these patients, we kept only the 78% who had a supplementary insurance ($n=1\ 080\ 892$). The rationale for keeping only these patients was that we wanted to compare between patients who chose to obtain SO via the health fund and those who chose to use the supplementary health insurance. Since patients who did not have a supplementary insurance could not choose to use it, we decided to filter them out.

Sixteen per cent ($n=176\ 306$) of the patients who had supplementary insurance sought at least one SO during

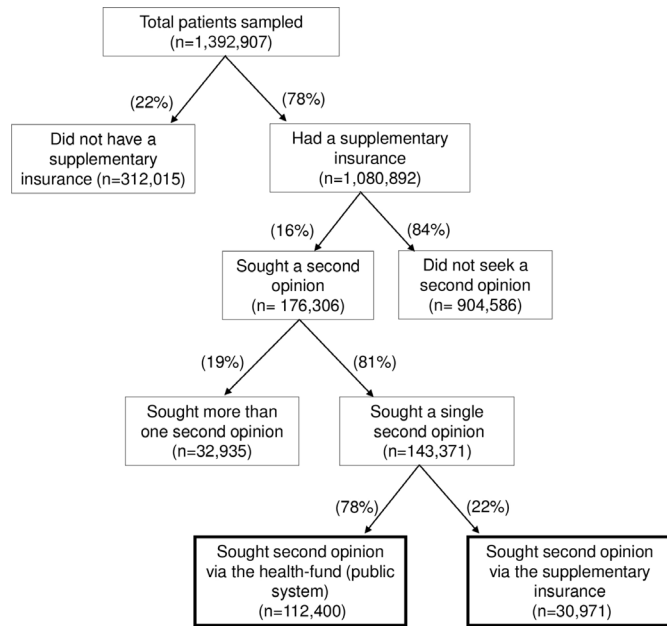


Figure 2 Study population: patients sought a second opinion by insurance type: health fund vs supplementary insurance.

the study period and the remaining 84% of the patients did not seek an SO (a detailed description of their characteristics appears in a previous study of ours³⁷). It is important to note that the electronic medical records of patients did not include an explicit field indicating whether a visit is an SO or not, and therefore we had to extract the records of all patients mentioned above and exclude patients who did not have an SO by applying our dedicated algorithm.

From the remaining 176 306 patients, we excluded 19% of the patients (n=32 935) who had more than one SO during the study period, and kept 81% of the patients (n=143 371) who had exactly one SO. This exclusion was done in order to be able to categorise patients such that they had their SO visit provided by the health fund and by the supplementary insurance. In contrast, patients who had more than one SO could have had one SO visit provided by the health fund and another by the supplementary insurance. We refer to these 143 371 patients as ‘the target population’.

Who sought a second opinion by insurance type: health fund versus supplementary insurance?

Table 1 presents the characteristics of patients who sought an SO via health fund versus supplementary insurance. Out of the entire target population (n=143 371), most were female (57%, n=81 531), were native-born Israelis or established immigrants (92%, n=1 31 484), were classified as middle socioeconomic status (59%, n=84 129), were living in central residential areas (62%, 88 176), were above age 60 (49%, 69 581) and were classified as not having any chronic disease by the Charlson Comorbidity Score (42%, n=60 820).

The univariate analyses showed significant differences ($p < 0.05$) between people who sought an SO via the health fund and those who sought an SO via the supplementary insurance, in age group, gender, immigration, socioeconomic level, peripheral level and Charlson Comorbidity Score (table 1).

Table 2 presents the results of the multivariate logistic regression analysis (reference group of each covariate are marked with a star). The significant covariates from the univariate analyses that remained significant in the multivariate logistic regression are: age group, gender, immigration, socioeconomic level and peripheral level, Charlson Comorbidity Score (except the 1–2 level). More specifically, women (OR=1.2, 95% CI 1.17 to 1.23), people aged 40–59 years (OR=1.36, 95% CI 1.31 to 1.42) and those with chronic conditions (OR=1.13, 95% CI 1.08 to 1.18) sought more SOs via the health fund than via the supplementary insurance. Old people (OR=0.62, 95% CI 0.6 to 0.64), native-born and established immigrants (OR=0.79, 95% CI 0.76 to 0.84), people in a middle socioeconomic level (OR=0.55, 95% CI 0.53 to 0.57) and in a high socioeconomic level (OR=0.39, 95% CI 0.37 to 0.4) and those living in central areas (OR=0.88, 95% CI 0.85 to 0.9) sought less SOs via the health fund than via the supplementary insurance.

Second opinion utilisation by specialty and insurance type

Table 3 presents the total number of consultations and SO rates (in parentheses) by specialties for the two insurance types. The rate of SO consultations for each specialty was calculated by dividing the number of SO consultations by the total number of consultations in that specialty. This was done in order to avoid cases of a high SO rate that is simply a result of a large number of consultations in a given specialty.

The highest proportion of SO consultations were sought from orthopaedic surgeons (17%) via both the health fund and the supplementary insurance. Other specialties with high SO utilisation were ENT, general surgery and ophthalmology, all presented a similar rate in the two insurance types.

DISCUSSION

Summary of main findings

Sixteen per cent of the patients who had supplementary insurance sought at least one SO during the study period. Particular patient profiles tend to seek SOs via the health fund rather than the supplementary insurance: women, people aged 40–59 years, immigrants, people in a low socioeconomic level, those living in periphery areas and those with chronic conditions. The highest proportion of SO consultations were sought from orthopaedic surgeons, both via the health fund and supplementary insurance.

Challenges raised by the findings

Although most of the SO seekers had a supplementary insurance which enables them reimbursement for private

**Table 1** Characteristics of patients in the target population who sought a second opinion via health fund vs supplementary insurance (n=143371)

Characteristics	Health fund n=112400 (%)	Supplementary insurance n=30971 (%)	P value
Age group (years)			
18–39	28 330 (25.2)	6 679 (21.6)	<0.001
40–59	33 346 (29.7)	5 435 (17.5)	
60+	50 724 (45.1)	18 857 (60.9)	
Gender			
Male	47 496 (42.3)	14 344 (46.3)	<0.001
Female	64 904 (57.7)	16 627 (53.7)	
Immigration			
Immigrants	9 874 (8.8)	2 013 (6.5)	<0.001
Native-born and established immigrants	102 526 (91.2)	28 958 (93.5)	
Socioeconomic level			
Low	27 014 (24.0)	4 025 (13.0)	<0.001
Middle	65 734 (58.5)	18 395 (59.4)	
High	19 652 (17.5)	8 551 (27.6)	
Periphery level			
Periphery of country	44 934 (40.0)	10 261 (33.1)	<0.001
Centre of country	67 466 (60.0)	20 710 (66.9)	
Charlson Comorbidity Score			
0	48 515 (43.2)	12 305 (39.7)	<0.001
1–2	43 931 (39.1)	12 583 (40.6)	
3–4	13 386 (11.9)	4 168 (13.5)	
5–25	6 568 (5.8)	1 915 (6.2)	
Total	112 400	30 971	

*Percentages are calculated as valid % per each variable in the column (ie, each variable in the column sums up to 100%, without missing values).

consultations, they have mostly obtained their SO via the health fund, which is an underutilisation of their supplementary insurance. Differences in profiles of SO seekers through the public and private system may explain why certain people with supplementary insurance do not use their entitlement for private SOs.

In Israel, the boundaries between the public and private systems are not clear. The public health funds are allowed to market supplementary health insurance^{3 7 8} and there are cases in which the same physicians were allowed to provide medical consultations under both private and public contracts.⁷ There are some cases where in order to shorten waiting times to a specialist within the secondary public system, some patients use their supplementary insurance and pay a copayment for ‘SO consultation service’, although they did not seek an SO in practice.⁴⁰

Another explanation is the impact of socioeconomic level, as a proxy to the ability to pay privately, which was evident in our findings. Income is a familiar social determinant associated with health disparities.⁴¹ High-income groups opt to use private health services⁴² and those with

a higher socioeconomic status consult with more specialists.⁴³ Even with the partial reimbursement for private consultations, these consultations might still be expensive to many people. Likewise, the entitlement is for three private consultations in a year, which may lead the less affluent to ‘cherry pick’ the private consultation to only cases they are most concerned about. There is evidence to suggest that copayments have created financial barriers to access, particularly for people with low incomes.⁴⁴ In 2014, 11% of the adult population refrained from taking medicines or visiting physicians within the NHI because of copayments or coinsurances.

Another possible explanation for the difference in profiles of SO seekers is the geographical context. Medical specialists tend to have their office locations close to hospitals located in central areas.⁴⁵ Our findings show that those living in central areas sought more SO in the private sector. It is also consistent with a Canadian study, showing that residents of the most urban centres were more likely to use specialist services.⁴⁶ A study conducted in Japan and the USA explained why

Table 2 Characteristics associated with seeking a second opinion by insurance type utilisation (health fund vs supplementary insurance) of the target population

Covariates	Exp(B)* (95% CI)	P value
Gender		
Male*	Reference	
Female	1.20 (1.17 to 1.23)	<0.001
Immigration		
Immigrants*	Reference	
Native-born and established immigrants	0.79 (0.75 to 0.84)	<0.001
Age group (years)		
18–39*	Reference	
40–59	1.36 (1.31 to 1.42)	<0.001
60+	0.62 (0.60 to 0.64)	<0.001
Socioeconomic level		
Low*	Reference	
Middle	0.55 (0.53 to 0.57)	<0.001
High	0.39 (0.37 to 0.40)	<0.001
Periphery level		
Periphery of country*	Reference	
Centre of country	0.88 (0.85 to 0.90)	<0.001
Charlson Comorbidity Score		
0*	Reference	
1–2	1.03 (0.99 to 1.06)	0.089
3–4	1.13 (1.08 to 1.18)	<0.001
5–25	1.28 (1.21 to 1.36)	<0.001

*Reference Exp(B).

physicians diffuse according to income distribution of the residence and not according to the population distribution. Another study found that physician office locations were affected by the principal factors of proximity to hospitals and in commercial areas.⁴⁵ Most of the hospital are located in central areas, hence this access allows certain patient groups who live in central areas more access to specialists (ie, where stronger socioeconomic levels reside) than those who live in peripheral areas and may increase private SO utilisation in these areas at the expense of rural areas, and therefore may introduce inequality in access to health services.

Our findings also show that new immigrants tended to use the health fund rather than the supplementary health insurance. A previous study found that new immigrants were more dependent on social benefits obtained from the Israeli National Social Security, as fewer of them had supplementary health insurance. Also, their socioeconomic status was lower. Thus, copayments may be another reason for underutilisation of SOs of new immigrants and those in low socioeconomic status.⁴⁷

Also, higher rates were found in orthopaedics and general surgery, perhaps because the decision to undergo a surgical procedure is more difficult (outcomes of a surgery are often irreversible and are prone to complications). This may reflect the clinical importance patients see in SOs. Indeed, multiple studies have shown discrepancies in clinical judgements^{12–17} and the potential of SOs to reduce unnecessary surgery.^{18–22} This effect might be even more extreme when waiting lists for physicians in the public systems are long and patients are concerned about urgency. In such cases, patients may opt for a private physician, where waiting lists are often shorter.

Policy implications

It is important to identify specific patient profile groups by their insurance type and devise appropriate mechanisms for access to SOs which will reduce gaps between those groups.⁴⁸ Providing data on SO utilisation by insurance type is important for health policy makers and healthcare providers in order to allocate resources more efficiently and reduce disparities in access to health services and health consumption.

The net expenditure on SOs in 2014 across supplementary insurance provided by the health funds was equivalent to US\$92.6 million.⁴⁹ The increase of private expenditures on SOs widens the gaps between those who can afford paying privately and those who do not have access to SO or the ability of paying copayments.^{50–52} This increase also raises ethical concerns about physician commitment to fulfil their mission publicly rather than privately.

On the one hand, having a private healthcare system alongside a public system has advantages such as increasing competition in service and quality of care. On the other hand, blurring of the boundaries between the

Table 3 The proportion of second opinion consultations from total consultations by specialty and insurance type (n=143371)

Specialty	Consultations via the health fund	Consultations via the supplementary insurance
Orthopaedics	307 463 (17%)	62 603 (17%)
General surgery	72 560 (15%)	15 164 (13%)
Ophthalmology	266 488 (13%)	61 122 (13%)
Ear, nose and throat	130 410 (11%)	27 985 (10%)
Dermatology	136 412 (11%)	30 236 (9%)
Gastroenterology	21 054 (10%)	5 898 (9%)
Cardiology	44 871 (8%)	14 071 (11%)
Urology	54 416 (7%)	20 392 (12%)
Neurology	26 600 (3%)	7 618 (9%)

Percentages represent the number of second opinion consultations in each specialty out of the total number of consultations in the specialty.

two systems may lead to an increase in private expenditure and may harm the principle of equality.

The debate whether SOs should be provided and covered by the government becomes especially interesting in Israel, as the share of private healthcare financing in Israel is one of the highest rates among OECD countries and it has the fastest increase relative to other high-income countries. The 'German Committee' for the strengthening of the public health system proposed some solutions such as splitting the private SO from the current supplementary insurance structure and providing it as a separate insurance. Currently, there is no policy regarding SOs as a tool for controlling surgical procedures or costs in Israel.^{3 8 51} Recently, new regulations were introduced in Israel, limiting physicians who see patients in the public sector to refer them privately, financed by their supplementary insurance. It is still relatively early to consider the implications of these new regulations, although early reports suggest that patients are moving more to the commercial private insurance option.⁵³

Health policy regarding SOs is a matter of balancing benefits and costs. Certain patient profiles could have benefited from SOs, but do not have the access in terms of costs and type of insurance they can afford or unavailability of specialists in their residential area. On the other hand, the policy should create the right balance to prevent overuse of SOs.

Another point for decision-makers, the high rates of SOs sought through the Israeli health funds illuminate the need to allocate resources for that purpose, especially in periphery areas, where there is less access to specialists. In the same context, considering the tendency of specialists to reside in central urban areas, it is recommended to incentivise specialties to work in the periphery in order to increase access and availability in those areas.

Strengths and limitations

This study presents a large-scale population analysis based on an innovative algorithm aimed to study and characterise SO utilisation by insurance type. This study is unique and first of its kind in exploring the relation between the utilisation of SO provided by the health fund or by supplementary insurance.

Having up-to-date data on SO utilisation by segmentation of insurance type is important to policy makers in order to identify whether SOs are used appropriately and equitably.

While our study was conducted in Israel only, it suggests a generic tool that can become standard and common in modern medical practice worldwide. To the best of our knowledge, all previous studies that evaluated SO utilisation used self-reported surveys with relatively small samples; hence, we could not find any objective data on SO utilisation. Our results possibly reinforce a universal phenomenon. Providing insights from large data sets have relative advantages versus self-reported data by suggesting an objective measurement and reducing the costs of data collection. In addition, such a systematic and objective method of measurement may allow in the future

a comparison of outcomes across countries. The current situation which relies on self-reported surveys using different methods of measurement is clearly less suited to obtain this goal. Finally, the relatively large sample size enables statistical analysis in groups that have relatively low representation in the population, such as by sectors, socioeconomic status, etc, especially when it comes with medical services utilisation. On the downside, the nature of this method is unable to shed light on the reasons that led patients to their decisions. Such information, if needed, should still be collected using self-reported surveys. Moreover, it is not always easy to obtain electronic medical records about the entire population. An interesting future research would be to estimate how much data are needed for similar studies, perhaps by applying some power calculations.

Moreover, this study is based on a linkage between rarely linked datasets: universal insurance data and supplementary insurance, containing data on private consultations.

There are several limitations to this study. First, the definition of an SO as 'consulting with another specialist, in the same specialty' relies on the assumption that consequent consultations with different physicians in the same specialty (eg, two neurologists) in a relatively short period of time, may hint that the second consultation was for obtaining an SO. But patients may approach two physicians in the same domain for other reasons such as a different medical problem or may approach physicians in different domains for the same clinical problem (eg, an orthopaedic surgeon and a neurologist for back pain). We approached this issue by conducting a survey⁵¹ that explores in depth the reasons for seeking an SO. Another limitation is the lack of data on consultations to private physicians that are not claimed back from the supplementary insurance and the lack of data from private health insurances. Including such data may provide a more comprehensive analysis.

CONCLUSIONS

This study provides a population-based estimation of SO utilisation and the characteristics of SO seekers by their insurance type: health fund versus supplementary insurance. Particular patient profiles tend to seek SOs via the health fund rather than the supplementary insurance: women, people aged 40–59 years, immigrants, people in a low socioeconomic level, those living in periphery and those with chronic conditions. The highest proportion of SO consultations were sought from surgeons, both via the health fund and supplementary insurance. People from the centre of the country and from high socioeconomic status sought more SOs via the supplementary insurance, assuming that medical specialists tend to reside in central urban areas, close to big hospitals. Further research is recommended to examine the availability of medical specialists by specialty and residence. These kinds of data will be essential for policy makers to understand the distribution of specialties who provide SO

by specialty and residence, and to examine the ratio of service providers per clients by residential area. Likewise, a cost-benefit analysis of outcomes of SOs may be useful to devise further policy on the inclusion of SO in public and private settings.

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