Pilot study of methods for assessing unmet secondary health care need in New Zealand

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ABSTRACT

AIMS: In this pilot study, the primary aim was to compare four potential methods for undertaking a national survey of unmet secondary healthcare need in New Zealand (one collecting data from GPs, and three from community surveys). The secondary aim was to obtain an estimate of the prevalence of unmet secondary healthcare need, to inform sample size calculations for a national survey.

METHODS: An electronic system was set up for GPs in Christchurch (Pegasus PHO) and Auckland (Auckland PHO) to record cases of unmet need as encountered in clinics. For the community surveys, a questionnaire developed by the authors was administered to people from the same electoral wards as the GP clinics. Three modes of questionnaire administration were trialled: online, telephone and face-to-face interview. Random population sampling from the Māori and General Electoral Rolls was used to identify eligible survey participants until there were approximately 200 respondents for each method in each city. Data collection took place from November 2015 to February 2016.

RESULTS: GP reports: Pegasus PHO: 8/78 eligible practices recorded 28 cases of unmet secondary healthcare need in 10 weeks. Auckland PHO: 3/26 practices participated and recorded no cases in three weeks.

Surveys: 1,277 interviews were completed (online 428, telephone 447, face-to-face 402).

For primary healthcare, 211/1,277 (16.5%) had missed a GP visit because of cost (online 25.0%, telephone 11.6%, face-to-face 12.9%). For secondary healthcare, 119/1,277 (9.3%) reported unmet healthcare need that had been identified by a health professional (online 11.2%; telephone 9.2%; face-to-face 7.5%). Of these, 75/119 (63.0%) required a consultation, and 47/119 (39.5%) required a procedure.

Completed interview rates as a percentage of names on the Electoral Roll were low (online 8.8%, telephone 15.4%, face-to-face 13.9%), affected by changed addresses and lack of listed telephone numbers. The response rate for those with valid phone numbers was 47.6%, and for those with valid addresses was 31.5%.

CONCLUSIONS: Using the Electoral Rolls to identify respondents is problematic. For a national survey, random population sampling by address, similar to the method employed for the New Zealand Health Survey, but giving respondents a choice between face-to-face and phone interviews, is proposed. Asking GPs to record data on unmet need for secondary care was not successful. Our pilot study suggests there is sufficient unmet secondary healthcare need in New Zealand to merit a national survey.

Universal healthcare was adopted, by consensus, as a global objective by the United Nations General Assembly in 2012.[1] However, even in countries with state-funded health systems, there is evidence of unmet need and inequitable access to health care services.[2,3] Both 'need' and 'unmet need' for healthcare can be difficult to define and measure.[4,5] However, both are key indicators of the effectiveness of a health system, so surveys of unmet need, including questions in international health surveys, have been carried out in many countries.[6–9]

Methods for estimating the prevalence of unmet need for healthcare in other countries have ranged from questions in large-scale surveys such as the EU Survey of Income and Living Conditions (EU-SILC) and the

Canadian Community Health Survey (CCHS), to computer-assisted telephone interviews of random samples of adults[8] and household surveys.[10,11] In the EU-SILC, nationally representative probability sampling and personal interviews were used for the section of the survey that includes questions on unmet need.[12] The CCHS used multi-stage stratified cluster sampling of households, with random selection of an adult from each household to be interviewed in person (86%) or by telephone.[13] Surveys in Thailand and in Sierra Leone were undertaken by field workers or trained medical and nursing students respectively, who visited households and carried out face-to-face interviews.[10,11] A 2013 survey of adults in 11 countries used computer-assisted telephone interviews, including mobile phone numbers as well as landline numbers.[8]

In Europe, estimates of the prevalence of unmet need for healthcare (primary and secondary healthcare) have ranged from low prevalence of 0.4% in Switzerland, 1.2% in Spain and 1.6% in Sweden to high prevalence of 15.6% in Turkey, 19.7% in Russia and 24.8% in Ukraine.[2] The prevalence of unmet healthcare need in Thailand was estimated at 1.4% for outpatient and 0.4% for inpatient services respectively,[10] while the prevalence of untreated surgical conditions in Sierra Leone was 25%.[11] In Canada the prevalence of unmet health care need in the previous 12 months was 13.2%.[14] Comparisons between countries are limited by differences in the definitions used, types of unmet need measured and differences in survey methods. The New Zealand Health Survey (NZHS), undertaken by the Ministry of Health, "focuses on health service utilisation and patient experience" and provides the only comprehensive source of New Zealand data on unmet need.[15] It collects data on unmet primary healthcare need (PHN) by asking if people have missed out on primary care consultations, after-hours care, dental care or prescriptions because of cost or because of difficulties with transport.

Some studies have reported on deficiencies in specific medical, surgical and mental secondary healthcare services in New Zealand.[16–18] However, unmet secondary healthcare need (SHN) is not routinely measured in this country. The New Zealand Ministry of Health states that information on the use of secondary services can be captured from administrative databases;[15] however, only about 50% of private hospital discharges are recorded, and there are only limited data available on patients in need who are not referred.[19,20]

Because a national survey of unmet need for secondary care has never been undertaken in New Zealand, prior to planning a national study, we sought to establish a reliable and efficient method of measuring unmet SHN in New Zealand with a pilot study. A system of routine notification from GP practices had potential to provide an efficient and effective method for estimating the prevalence of unmet need for secondary care, including patients who were not referred for secondary care, but crucial information such as the acceptability and uptake of this method were unknown. A population survey using the methodology of the New Zealand Health Survey would be expensive, and whether alternative methods could provide equivalent prevalence estimates for the New Zealand population, was unknown. Thus, the primary aim of the pilot study was to: test the possibility of using anonymous data downloaded from general practice patient management software (PMS), similar to the routine notification system used by the New Zealand Ministry of Health as part of the National Patient Flow programme,[21] and trial a population questionnaire comparing three survey methods (online, face-to-face and telephone interviews). The secondary aim was to provide an indication of the approximate prevalence of unmet SHN and the sample size required to estimate it with acceptable precision. The pilot was located in Christchurch and Auckland with the assistance of Pegasus and Auckland Primary Health Organisations (PHOs).

Key information to be delivered from the pilot study was:

- whether face-to-face interviews result in a higher response proportion than telephone contacts
- whether the high cost of face-to-face interviews is justified
- whether inexpensive electronic surveys generate adequate response proportions
- to what extent GP recording of unmet need (anonymous data downloaded from practice management software)

compares with need as reported by survey

- An indication of the approximate prevalence of unmet need and the sample size required to estimate it.

To our knowledge, these four methods for estimating the prevalence of unmet SHN have not been compared before.

Methods

GP survey arm

The authors consulted with a range of general practitioners (N=190) in Christchurch and Auckland and asked them whether they could identify areas of unmet need for secondary health care; no restriction was placed on the number of examples of unmet need each GP could list. Most felt that there was significant unmet SHN. On average, each GP identified three areas of need in which supply was inadequate, with 8% of GPs listing six or more areas of need.

Software tools that allowed GPs to record instances of unmet SHN were developed and installed at Pegasus and Auckland PHO practices. Pegasus practices used a PMS screening entry and Auckland practices used an electronic advanced form. These allowed GPs to classify a patient's unmet SHN and to indicate why the need was unmet. Participating GPs were asked to record instances of patients' unmet SHN as they were encountered in consultations. Data were extractable centrally and anonymously from participating practices' PMS by both PHOs.

Eight types of unmet SHN could be entered in pre-determined categories (colonoscopy, counselling, cholecystectomy, gastroscopy, hernia, joint replacement, dental care, varicose veins); these were selected from the findings of the consultation with GPs mentioned above, conducted in 2015, where participants were asked to list "areas of unmet secondary healthcare need that affect your patients and/or interfere with your capacity to provide desirable care." Other types of unmet need could be entered in an 'other' category.

In Pegasus PHO the unmet SHN recording tool was automatically installed at all practices using the appropriate PMS configuration. Data were collected at Pegasus practices for ten weeks between January and March 2016.

In Auckland PHO, the unmet SHN recording tool was installed at practices that indicated willingness to be involved in the study. Data were collected at Auckland practices for three weeks between February and March 2016.

GPs in Pegasus and Auckland PHOs were informed about the study by their PHO practice facilitators, and were encouraged to participate by their PHOs. Pegasus GPs also received two emails from a member of the study team outlining the study and encouraging participation.

When data collection ceased, a non-responder survey was conducted. Twenty non-responding practices were randomly selected. A GP at each practice was contacted by phone or email and asked whether they had been aware of the unmet need survey, whether they had encountered instances of unmet SHN among their patients in the previous three months and, if so, what had prevented them from recording unmet SHN during the data collection period.

Population survey arm

The population survey was undertaken by the company *Research First* (http://www.researchfirst.co.nz/) from November 2015 to February 2016 (letters were sent in November 2015). The online survey was open from 5 November to 30 November, telephone interviewing took place between 15 November and 7 December 2015 and face-to-face interviewing took place between 15 November 2015 and 3 February 2016. A computer-generated random sample was drawn from the Māori and General Electoral Rolls (from Electoral Roll data provided by the Electoral Commission in July 2015).

The random sample was drawn from all electoral wards in Christchurch; Auckland PHO has a majority of its patients in only six electoral wards and, to improve comparability, the sample was drawn only from these. Addresses that were outside the areas covered by the PHOs were excluded. The target population was the usually resident, non-institutionalised population of New Zealand aged 18 years and over, residing in permanent private dwellings. People living in non-private dwellings, rest homes, hospitals and psychiatric institutions, and penal institutions were excluded. Participants were randomly allocated to three groups. For each city, based on the

experience of the research company with likely contact and response rates for each method, 2,500 people were selected for the online survey arm, 1,500 for the phone arm and 1,500 for the face-to-face arm, giving a sample of 11,000. Sample size calculations had suggested that, for a reliable prevalence estimate (95% confidence interval <+/- 5%), 200 informants for each survey method in each city would be needed; recruitment continued until approximately this number had been reached.

An invitation letter and an information sheet were mailed to all those sampled; these explained the purpose of the study and gave potential respondents the opportunity to opt-out.

Those selected for the online approach were given a link, a code and a password. Those selected for the telephone approach were informed that they could expect a call (both landlines and mobiles were called, if they were listed numbers); up to six call-backs were made. Those selected for a face-to-face interview were informed they could expect a visit. Homes were visited up to seven times (the initial call, plus up to six call-backs) in order to make contact with the potential respondent.

Telephone calls and face-to-face interviews were distributed across all days of the week and occurred between 9.30am and 8.30pm on weekdays and from 10am to 5pm on weekends.

Using a questionnaire developed by the authors (Appendix 1), respondents were asked about missing any of three aspects of primary care because of cost and about missing primary care for any reason in the last 12 months. The questions were based on those used internationally, (EU-SILC, and CCHS) or were similar to those used by the NZHS. Because the New Zealand Health Survey includes questions on unmet need for primary care, but not for secondary care, questions on unmet need for primary care were included in the pilot questionnaire so we could compare our estimates of the prevalence of unmet need for primary care with the population estimates from the New Zealand Health Survey. We also included questions about unmet PHN (such as the cost of seeing a GP) that impact on SHN. We developed question 8 based on the feedback we received from Pegasus GPs (the examples of operations/healthcare were the ones identified by GPs as areas of unmet need). Question 13 is a health status question used in many surveys—a similar question is used in the New Zealand Health Survey. Questions 16–20 were derived from the New Zealand Census, so we could compare our respondents with the wider New Zealand population.

Respondents were asked whether they had not received secondary health care that had been recommended by a doctor or other health professional in the previous five years, and another question asked about the nature of the most recent secondary care that had been missed. Respondents who had missed primary or secondary care were asked why the care had not been received and what impact this had had on their life.

The research was approved by the Human Ethics Committee of the University of Canterbury on 14 May 2015 – Reference HEC 2015 / 20 / LR – PS.

Results

GP survey arm

Seventy-eight of Pegasus PHO's 109 practices had a PMS that was configured to allow installation of the software tool used for data collection, which made them eligible to participate in the study. However, despite encouragement from their PHOs, only eight practices responded and only three responded out of the 26 practices in Auckland PHO.

Twenty-eight cases of unmet SHN were recorded from the eight Pegasus PHO practices across a diverse range of health procedures. Only six cases were in the named eight categories (two colonoscopies, one gastroscopy, two hernias and one varicose veins). There were six cases of musculoskeletal problems and three cases of radiology. The most common referral issue was "did not meet DHB criteria" (eight cases) followed by "previously referred to public service and declined for assessment" (six cases). No reports of unmet SHN were received from any of the Auckland PHO practices.

One GP from each of 20 randomly selected non-responding practices was contacted. Of these GPs, 14 (70%) were aware of the study, and 19 (95%) had seen

patients with unmet SHN in the last three months. Non-responders were asked to give reasons for their non-response and four key themes were identified: the GP was unaware of, or had misunderstood the instructions for, the survey;[6] the GP was too busy;[6] the GPs were completing another study examining unmet need;[3] and no patients with unmet SHN were seen.[1] Because of the sparse nature of the GP responses, no comparison was made with the results of the population survey.

Population survey arm

For each survey type; online, face-to-face and telephone, sampling continued until there were 400 participants (approximately 200 participants in each city). Table 1 shows the numbers approached in order to achieve this. For the online survey this was achieved without any reminder.

The online arm of the pilot required the highest number of initial letters to be mailed in order to achieve the required sample size. The completion rate was the lowest at 8.8%; a few letters were returned and some refusals were received, but there was no information from the other 91.2% who were mailed. Some may no longer be at the mailed address, others might not have had access to a computer. Therefore it is not

Table 1: Sampling yields and completion rates (as percent of those mailed).

	Online		
	Christchurch	**Auckland**	**Both**
Total sample (mailed)	2,446	2,426	4,872
Mail returned	75	61	136
Refusal	60	28	88
Completions	248	180	428
Completion rate	10.1%	7.4%	8.8%
	Telephone		
	Christchurch	**Auckland**	**Both**
Total sample (mailed)	1,459	1,452	2,911
Available phone number	557	438	995
Disconnected	30	26	56
Refusal	262	159	421
Completions	232	215	447
Completion rate	15.9%	14.8%	15.4%
	Face-to-face		
	Christchurch	**Auckland**	**Both**
Total sample (mailed)	1,451	1,447	2,898
Address visited*	868	892	1760
No longer resident/inaccessible	237	246	483
Not available	272	292	564
Refusal	148	154	302
Completions	202	200	402
Completion rate	13.9%	13.8%	13.9%

*Not all addresses needed to be visited once the required quota had been achieved.

Table 2: Gender profile of respondents by survey method.

Methodology	Total		Online		Telephone		Face-to-face	
Total number	N=1,277	%	n=428	%	n=447	%	N=402	%
Male	548	43%	158	37%	199	45%	191	48%
Female	729	57%	270	63%	248	55%	211	52%

possible to calculate a response rate from those eligible to respond to the online arm of the study.

For the telephone arm of the study, only 34.2% of the original sample had valid listed phone numbers. The response rate among those with valid phone numbers was 47.6%.

For the face-to-face arm, 27.4% of those visited could not be reached because they had moved and the response rate for the remainder was 31.5%.

The three methods differed in cost—the estimated cost per completed interview was approximately $31 for online, $41 for telephone and $73 for face-to-face administration of the questionnaire.

Characteristics of respondents

The characteristics of the respondents across survey method and cities were compared. The mean age of the respondents was 54.4 years. Differences in age across sites and methods were relatively minor; the mean age of those responding by phone was slightly less than the other two methods. Almost 57% of respondents were women.

The commonest reported ethnicity was European, 80% of respondents (87% in Christchurch and 72% in Auckland). Māori were significantly under-represented with only 2.6% of respondents (2.3% in Christchurch and 2.9% in Auckland); 3% reported as Pacific peoples; almost all were in the Auckland sample; 7% reported as Asian (3% and 13%).

Other characteristics of those responding included that 77% rated their health as good or better; the equivalent figure from the NZHS was 89%.[15] Respondents in Auckland and Christchurch had the same chance of being employed (60%) but those in Auckland were more likely to have private health insurance: 56% vs 41%. Auckland respondents were more likely to be in households with incomes over $150k (20.6%) than were Christchurch respondents (6.9%).

The online sampling yielded the least representative sample. Sixty-three percent were women (Table 2). It had the highest percentage reporting as European (85% compared to 82% for telephone and 72% for face-to-face); and the lowest percentage as Asian (4% compared to 5% for telephone and 14% for face-to-face).

Estimate of unmet need for primary and secondary health care

Primary—Of the 1,277 respondents, 367 (28.7%) reported one or more unmet PHN (Table 3). Reasons for unmet PHN included missing a GP visit due to cost: 211 (16.5%); missed filling a prescription due to cost: 63 (4.9%); and missed a test, treatment or follow-up due to cost: 146 (11.4%). GP help had been missed "for any reason" by 199 (15.6%).

Table 3: Reasons for unmet primary healthcare need in last 12 months.

Methodology	Total		Online		Telephone		Face-to-face	
Total number	N=1277	%	n=428	%	n=447	%	N=402	%
Didn't visit doctor because of cost	211	16.5%	107	25.0%	52	11.6%	52	12.9%
Missed script/meds because of cost	63	4.9%	27	6.3%	16	3.6%	20	5.0%
Missed test, Rx, FU because of cost	146	11.4%	76	17.8%	30	6.7%	40	10.0%
Missed GP help, any reason	199	15.6%	82	19.2%	65	14.5%	52	12.9%
Any of the answers combined	367	28.7%	161	37.6%	108	24.2%	98	24.4%

Table 4: Types of unmet secondary healthcare need in last five years.

	All	Online	Telephone	Face-to-face
Number of respondents	1,277	428	447	402
Number with any need	119	48	41	30
Total needs	132	57	42	33
Needs per person	1.11	1.19	1.02	1.10
Percentage with any need	9.3%	11.2%	9.2%	7.5%
Specific needs (% of those with any needs)				
Orthopaedic operations	15.1%	14.6%	19.5%	10.0%
General surgical operations	12.6%	10.4%	12.2%	16.7%
Endoscopy	9.2%	12.5%	4.9%	10.0%
Other procedures	2.5%	4.2%	0.0%	3.3%
Surgical consults	15.1%	10.4%	26.8%	6.7%
Medical consults	31.1%	35.4%	22.0%	36.7%
Dental consults	11.8%	12.5%	9.8%	13.3%
Psyche consults	5.0%	8.3%	4.9%	0.0%
Non-specific	8.4%	10.4%	2.4%	13.3%
Any procedure	**39.5%**	**41.7%**	**36.6%**	**40.0%**
Any non-procedure	**71.4%**	**77.1%**	**65.9%**	**70.0%**

Unmet PHN for the online survey was 50% higher than for face-to-face or telephone interviews.

Secondary—Of 1,277 respondents, 119 (9.3%) mentioned an unmet SHN that had been identified by a doctor or other health professional in the last five years (Table 4). Thirty-nine percent of this unmet need occurred within the last year and a total of 63% within two years. A number of people mentioned two or more issues for a total of 132 issues. Of the 119 respondents mentioning any unmet SHN, procedures were said to be required by 47 (39.5%); the largest numbers were in orthopaedics 18 (15.1%), general surgery 15 (12.6%) and endoscopy 11 (9.2%). Consultations were required by 75 (63.0%) of the 119; these were classified as medical 37 (31.1%), surgical 18 (15.1%), dental surgery 14 (11.8%) and psychiatry/counselling 6 (5.0%).

The prevalence of unmet SHN was higher in the online sample (11.2%), intermediate in the telephone (9.2%) and lowest in the face-to-face (7.5%) sample.

Those who mentioned unmet PHN or SHN were asked how their life had been affected by not getting the help they needed (Table 5). An answer was available from 213 of those with an unmet PHN and from all the 119 with an unmet SHN. The commonest positive response was "pain or other symptoms" and was given by 46/213 (21.6%) relating to unmet PHN and by 50/119 (42.0%) relating to unmet SHN. The second commonest response was "worry, anxiety and stress" and was given by 36/213 (16.9%) relating to unmet PHN and by 19/119 (16.0%) relating to unmet SHN.

Primary and secondary unmet need

The prevalence of unmet PHN and SHN were examined. The following list summarises the key findings:

1. The prevalence of both unmet PHN and SHN was higher among those responding to the online survey (refer Tables 3 and 4), but this difference was statistically significant only for

Table 5: Impact of unmet need.

(% of those with any needs)	Primary		Secondary	
Worry, anxiety, stress	36	16.9%	19	16.0%
Worry or stress for family or friends	1	0.5%	1	0.8%
Pain or other symptoms	46	21.6%	50	42.0%
Problems with activities of daily living	9	4.2%	13	10.9%
Loss of work	6	2.8%	7	5.9%
Loss of income	3	1.4%	0	0.0%
Increased dependence	2	0.9%	1	0.8%
Increased use of over-the-counter drugs	4	1.9%	2	1.7%
Overall health deteriorated, condition got worse	16	7.5%	12	10.1%
Health problem improved	4	1.9%	2	1.7%
Personal relationships suffered	2	0.9%	3	2.5%
Unable to do (or do as much) child care	1	0.5%	1	0.8%
Increased cost	10	4.7%	0	0.0%
Care unsatisfactory	14	6.6%	3	2.5%
Other	32	15.0%	13	10.9%
No impact	43	20.2%	21	17.6%
Not answered/declined/don't know	10	4.7%	6	5.0%
Total number of items	**239**	**112.2%**	**154**	**129.4%**
Total number of respondents	**213**	**100.0%**	**119**	**100.0%**

unmet PHN (χ^2=24.7 p<0.001, and χ^2=2.7 p=0.1 respectively).

2. People reporting unmet PHN were more likely to report unmet SHN; 64 of 367 (17.4%) with PHN had unmet SHN, compared to 55 of 908 (6.1%) without PHN (χ^2=40, p<.001).

Reasons healthcare was not received

Respondents who had not received help from a GP for unmet PHN were asked to give reasons. A total of 226 items were recorded from 212 respondents. The most common reasons were: 'Too expensive'—given by 52 (24.5%) of respondents; 'Could not take time'—by 28 (13.2%); and 'Waiting list too long'—by 24 (11.3%). It is likely that the last response indicates an inability to get an appointment within a reasonable time (GPs do not usually have formal waiting lists).

Similarly, respondents were asked why they had not received needed secondary care. A total of 124 reasons were recorded from 119 respondents. The most common reasons were 'Not available at public hospital/below public hospital threshold'—given by 53 (44.5%), and 'Could not afford to pay for operation/procedure/ healthcare'—given by 32 (26.9%). Eleven (9.2%) were currently on a waiting list.

Discussion

GP survey arm

Of the 81 participating practices, reports came from just eight Pegasus PHO practices; the majority of GPs who could have recorded data did not do so. Our non-responder survey showed that while the majority of GPs were aware of the survey and had encountered instances of unmet SHN during the study period, most did not use the study software tools to record these instances. For some GPs, recording unmet SHN was simply forgotten while others

gave pressure of workload as a reason for non-completion. Only 28 instances of unmet SHN were recorded from the eight practices that reported. In summary, recording unmet SHN in primary care was not found to be a reliable means of collecting these data, though potentially it could be made more effective by providing primary care with dedicated resources to undertake data collection. It cannot, however, record unmet SHN in that section of the population which is unable to access GP care and secondary healthcare referral because of financial or other reasons. Other studies have shown cost to be a barrier to accessing GP care,[8,22] and this in turn is likely to have a negative impact on access to secondary care.

Population survey arm

None of the three survey techniques we piloted approached the capacity of the method used for the NZHS, to obtain a representative sample. Because we used the Electoral Roll as the initial sampling frame, all three methods were disadvantaged by inaccurate addresses related to the high mobility of New Zealanders (nearly a third of those on the Electoral Roll no longer lived at the listed address). The online methodology was the least expensive but generated the least representative sample, in part because nearly a quarter of New Zealanders do not have access to the internet at home.[23] Because we had no access to email addresses, respondents had to copy the link to the survey website from the invitation letter and enter it, rather than clicking on it, which complicated the process. Those with good computer skills and people who had experienced unmet need may have been more likely to respond. The telephone methodology was hampered by difficulty accessing telephone numbers in addition to housing mobility. Landline use has declined in New Zealand as the use of mobile phones has increased.[23] The face-to-face methodology although also limited by incorrect addresses on the Electoral Roll, mitigated some of the described shortcomings of the other two sampling methods; it was, however, the most expensive. The Auckland sampling area was limited to the Electoral wards served by the Auckland PHO, so that a comparison could be made between the population survey and the GP survey. This comparison did not take place, because the pilot study demonstrated that an online GP survey was inappropriate. This was an important finding of the pilot study; leading us to conclude that population sampling would be the most appropriate method for a national survey of unmet SHN.

About 29% of our respondents reported unmet PHN. The NZHS 2015 Summary of Results reported that 27.1% of the New Zealand adult population have unmet PHN;[15] this figure combines data from five questions covering a range of issues similar to those reported here. The similarity in results suggests the prevalence estimates from our pilot study are valid. Across the EU, where primary care is typically free, the average prevalence of unmet PHN is 2.5%.[6] The Commonwealth Fund reports the prevalence of missed primary health care for those with above average and below average income; only the US (24% and 49%) has higher values than New Zealand (19% and 29%).[7]

About 9% of our respondents reported unmet SHN. There do not appear to be any comparable international data specifically restricted to such unmet SHN. Studies by the Health Funds Association of New Zealand and New Zealand Private Surgical Hospitals, in 2013 and 2016,[19,20] surveyed 1,830 and 1,800 adults respectively and calculated the prevalence of unmet need for elective surgery at 5% on both occasions. It is unclear if endoscopies or dental surgery were included, and the need for consultation was not assessed. Taking this into consideration, their findings are broadly similar to those reported here.

We conclude from these preliminary pilot data that: (i) unmet PHN is likely to be present among at least 25% of the adult population, and (ii) 9% is a reasonable estimate of the prevalence of unmet SHN for the purposes of predicting the required sample size for a national population survey.

Assuming a prevalence of unmet PHN and unmet SHN of approximately 29% and 9% respectively, a responding sample of 500 would be needed for each group of interest (eg 10,000 for 20 DHBs) to generate an estimate of the prevalence of unmet need, with a 95% confidence interval of plus or minus approximately 4% and 2.5% respectively.

The pilot study allowed us to determine that:

- None of the piloted population survey methods had the capacity of the method used for the NZHS, to generate a representative sample
- GP recording of unmet need is not recommended as a method to estimate the prevalence of unmet need for secondary health care, because very few GPs participated
- Despite their limitations, all the piloted survey methods identified some unmet need for secondary health care. The pilot survey and the New Zealand Health Survey produced similar estimates of the prevalence of unmet PHN, which suggests that our estimate of the prevalence of unmet SHN is adequate to calculate the sample size required to estimate the prevalence of unmet SHN in a national study.

Proposed methodology for a national survey

In the pilot study, potential respondents were identified from the Electoral Roll. Our findings indicated that this document ages rapidly and a significant number of people were no longer at the address given; further, listed landline and mobile phone numbers were often not available. These problems contributed to the low contact rates in the pilot study. Although it is more expensive, a future national survey of unmet SHN should use an approach similar to that used for the NZHS in order to obtain an adequate representative response proportion. The NZHS, using household visits followed by face-to-face interviews, obtains a response proportion of 79% after excluding ineligible households (vacant sections, vacant dwellings and non-residential dwellings) but allows up to 10 call backs (visits) to secure an interview. In order to reduce costs, we propose household contacts followed by face-to-face interviews or telephone interviews. (We have the option of offering a telephone interview because, unlike the NZHS, we would not need to take measurements such as height, weight and blood pressure from participants). Two previous national surveys have offered the option of face-to-face or telephone interviews.[13,24] As in the NZHS, over-sampling of Māori will be undertaken so that Māori-specific prevalence estimates of unmet SHN can be made.[25]

Surveys may find it difficult to recruit Māori participants, so the recruitment approach for this survey will be designed to maximise Māori participation.[26] This will involve testing the survey materials to ensure they are appropriate for Māori participants, ensuring relevant Māori organisations are aware when the survey is being conducted in their area, having Māori interviewers, and prioritising resources to achieve an adequate number of Māori participants.

Conclusions

For the estimation of the prevalence of unmet SHN, random population sampling by address should be used and respondents could be offered a choice between face-to-face and phone interviews. Asking GPs to record unmet need for secondary health care at clinical presentation was not worthwhile because very few GPs participated. Investigation of ways to increase GP participation in routine recording of unmet need may be worthwhile, however this would not capture unmet need in people who cannot afford to access primary care. The pilot survey indicates that there is unmet SHN (as well as PHN) in New Zealand, which impacts individuals' well-being and productivity. A national survey of unmet SHN would be a valuable contribution to service assessment and planning in New Zealand.

Competing interests:
Prof Hornblow reports personal fees from Pegasus Health (Charitable) Ltd during the conduct of the study and outside the submitted work.

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Appendix

Questionnaire—pilot study of unmet secondary healthcare need

1. During the last 12 months, was there a time when you had a medical problem but did not visit a doctor because of the cost?
   - ☐ Yes
   - ☐ No
   - ☐ [*Do not read*] Not applicable
   - ☐ [*Do not read*] Not sure
   - ☐ [*Do not read*] Decline to answer
2. During the last 12 months, was there a time when you did not collect a prescription, or you skipped doses of your medicine because of the cost?
   - ☐ Yes
   - ☐ No
   - ☐ [*Do not read*] Not applicable
   - ☐ [*Do not read*] Not sure
   - ☐ [*Do not read*] Decline to answer
3. During the last 12 months, was there a time when you skipped a medical test, treatment or follow up that was recommended by a doctor because of the cost?
   - ☐ Yes
   - ☐ No
   - ☐ [*Do not read*] Not applicable
   - ☐ [*Do not read*] Not sure
   - ☐ [*Do not read*] Decline to answer
4. During the last 12 months, was there ever a time when you felt that you needed the help from a GP but you did not receive it for any reason?
   - ☐ No—**If no,** please go to question 7
   - ☐ Yes—**If yes,** please go to question 5
5. Thinking of the most recent time, why didn't you get this health care?

   Verbatim response:

   [*Classify response—more than one reason can be identified*]
   - a. ☐ Could not afford to (too expensive)
   - b. ☐ Waiting list too long
   - c. ☐ Could not take time off because of work, caring for children or others
   - d. ☐ Too far to travel/no means of transport
   - e. ☐ Fear of doctor/hospitals/examination/treatment
   - f. ☐ Wanted to wait and see if the problem got better on its own
   - g. ☐ Did not know any good doctor or specialist
   - h. ☐ Other (*Specify*) _____
6. How was your life affected as a result of not getting help from your GP?

   Verbatim response:

(Classify responses—more than one response may be identified)

a. ☐ Worry, anxiety, stress
b. ☐ Worry or stress for family or friends
c. ☐ Pain or other symptoms
d. ☐ Problems with activities of daily living (eg dressing, driving)
e. ☐ Loss of work
f. ☐ Loss of income
g. ☐ Increased dependence (on relatives, friends)
h. ☐ Increased use of over-the-counter drugs
i. ☐ Overall health deteriorated, condition got worse
j. ☐ Health problem improved
k. ☐ Personal relationships suffered
l. ☐ Unable to do (or do as much) voluntary work
m. ☐ Unable to do (or do as much) child care
n. ☐ Other (*Specify*) _____

7. In the last five years, have you ever been told by a doctor or other health professional that you needed hospital or specialist care, but you have not received it?

☐ No— **If no**, please go to question 11
☐ Yes—**If yes**, please go to question 8

8. Thinking of the most recent time what was the hospital or specialist care that you did not receive? (*Tick the appropriate box*)

a. ☐ Hernia operation
b. ☐ Varicose veins operation
c. ☐ Gall bladder operation
d. ☐ Joint replacement operation
e. ☐ Colonoscopy
f. ☐ Gastroscopy
g. ☐ Tooth extraction or other dental care
h. ☐ Counselling
i. ☐ Other
    i. ☐ Other medical consultation
    ii. ☐ Other surgical consultation
    iii. ☐ Other (*Specify*) _____

9. What year was this? (*Year*) _____

10. What were the reasons for not getting the hospital or specialist care?

Verbatim response:

(*Classify response—several responses may be identified*)

a. ☐ Not available at a public hospital
b. ☐ Currently on a waiting list
c. ☐ Could not take time off because of work, caring for children or others
d. ☐ Too far to travel
e. ☐ Fear of operation/procedure
f. ☐ Problem got better on its own
g. ☐ Could not afford to pay for operation/procedure/healthcare
h. ☐ Other (*Specify*) _____

11. How was your life affected as a result of not getting the operation(s) or other hospital health care?

Verbatim response:

(Classify responses—more than one response may be identified)

a. ☐ Worry, anxiety, stress
b. ☐ Worry or stress for family or friends
c. ☐ Pain or other symptoms
d. ☐ Problems with activities of daily living (eg dressing, driving)
e. ☐ Loss of work
f. ☐ Loss of income
g. ☐ Increased dependence (on relatives, friends)
h. ☐ Increased use of over-the-counter drugs
i. ☐ Overall health deteriorated, condition got worse
j. ☐ Health problem improved
k. ☐ Personal relationships suffered
l. ☐ Unable to do (or do as much) voluntary work
m. ☐ Unable to do (or do as much) child care
n. ☐ Other (*Specify*) _____

12. Sometimes people have a condition and do not know if it could be improved with medical treatment or surgery. Examples could be varicose veins, a small hernia or frequent stomach aches. Do you have anything like this?

☐ No—**If no**, please go to question 13
☐ Yes—**If yes**, please describe…

13. In general would you say your health is… (*tick one response only*)

a. ☐ Very good
b. ☐ Good
c. ☐ Fair
d. ☐ Bad
e. ☐ Very bad
f. ☐ Don't know

14. What is your date of birth? (*day/month/year*)

☐☐/☐☐/☐☐☐☐

15. Which best describes you?

☐ Single
☐ Couple

[*Insert gender*] ☐ Male ☐ Female

16. Which ethnic group or groups do you belong to? (*include as many as given*)

a. ☐ New Zealand European
b. ☐ Māori
c. ☐ Samoan
d. ☐ Cook Island Māori
e. ☐ Tongan
f. ☐ Niuean
g. ☐ Chinese
h. ☐ Indian
i. ☐ Other such as DUTCH, JAPANESE, TOKELAUAN. Please state:

17. Are you in the paid workforce?
    ☐ No—**If no**, please go to question 19
    ☐ Yes—**If yes**, please go to question 18
18. What is your main occupation? (for example PRIMARY SCHOOL TEACHER, CLOTHING MACHINIST, MOTEL MANAGER, RECEPTIONIST etc. *Please list if respondent has more than one main occupation*)

19. If you are retired or not in the paid workforce, what was your main occupation? (*Please list if respondent had more than one main occupation*)

20. From all your sources of income, what was the total income that you (and your partner (*if there is one*)) got before tax or anything was taken out of it in the last year?
    a. ☐ Loss
    b. ☐ Zero income
    c. ☐ $1–$10,000
    d. ☐ $10,001–$30,000
    e. ☐ $30,001–$50,000
    f. ☐ $50,001–$100,000
    g. ☐ $100,001–$150,000
    h. ☐ $150,001 or more
    i. ☐ Don't know *If respondent knows his/her <u>after tax income</u>, please write here:*
    j. _____ ☐ Declines (*do not read out*)
21. Are you covered by any health or medical insurance?
    a. ☐ Yes—**If yes,** please go to question 23
    b. ☐ No—**If no**, please go to question 22
    c. ☐ Don't know—please go to question 22
22. Did you have health or medical insurance in the past?
    d. ☐ Yes *Why did you stop having this insurance?*
    Verbatim response:

    e. ☐ No
    f. ☐ Don't know
23. Do you have any comments on the adequacy of the New Zealand health system?
    Verbatim response:

    Interviewer's comments: