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# Datasets collected in general practice: an international comparison using the example of obesity

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**Abstract.** International datasets from general practice enable the comparison of how conditions are managed within consultations in different primary healthcare settings. The Australian Bettering the Evaluation and Care of Health (BEACH) and TransHIS from the Netherlands collect in-consultation general practice data that have been used extensively to inform local policy and practice. Obesity is a global health issue with different countries applying varying approaches to management. The objective of the present paper is to compare the primary care management of obesity in Australia and the Netherlands using data collected from consultations. Despite the different prevalence in obesity in the two countries, the number of patients per 1000 patient-years seen with obesity is similar. Patients in Australia with obesity are referred to allied health practitioners more often than Dutch patients. Without quality general practice data, primary care researchers will not have data about the management of conditions within consultations. We use obesity to highlight the strengths of these general practice data sources and to compare their differences.

**What is known about the topic?** Australia had one of the longest-running consecutive datasets about general practice activity in the world, but it has recently lost government funding. The Netherlands has a longitudinal general practice dataset of information collected within consultations since 1985.
**What does this paper add?** We discuss the benefits of general practice-collected data in two countries. Using obesity as a case example, we compare management in general practice between Australia and the Netherlands. This type of analysis should start all international collaborations of primary care management of any health condition. Having a national general practice dataset allows international comparisons of the management of conditions with primary care. Without a current, quality general practice dataset, primary care researchers will not be able to partake in these kinds of comparison studies.
**What are the implications for practitioners?** Australian primary care researchers and clinicians will be at a disadvantage in any international collaboration if they are unable to accurately describe current general practice management. The Netherlands has developed an impressive dataset that requires within-consultation data collection. These datasets allow for person-centred, symptom-specific, longitudinal understanding of general practice management. The possibilities for the quasi-experimental questions that can be answered with such a dataset are limitless. It is only with the ability to answer clinically driven questions that are relevant to primary care that the clinical care of patients can be measured, developed and improved.

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## Introduction

Across the world, currently there are few data about what actually happens in general practice consultations.[1] Without appropriate data it is impossible to measure and understand what is happening in general practice. Information about primary care is important to all stakeholders, from patients and practitioners through to funders and policy makers.[2] Any process to improve healthcare service delivery in general practice must start from a baseline understanding of the status quo.

'Big data' is recorded in high volumes and electronically recorded from a variety of sources.[3] Big data is an excellent source of information about health and disease at a population level.[4] There are two main ways that big data is collected in Australian general practice, through pathology or prescription data[2,5,6] or by extracting information from existing clinical general practice records.[7] However, the quality and consistency of big data continue to be problems.[3,7,8] Clinicians may enter clinical information in places in the record that are not extractable

(e.g. blood pressures in the 'free text' section of a record), pathology may be surrogate for a diagnosis but not specific and human error can occur in data entry.[9] Apart from large datasets in closed systems, for example Kaiser Permanente in the US,[10] there are few examples of quality datasets that are collected en masse, and all require significant financial investment.[11] It is not possible to collect large amounts of quality clinical data without financial investment in stakeholder engagement, clinician training for data entry and data cleansing.[2,4,12]

Up until 2016, the Australian Bettering the Evaluation and Care of Health (BEACH) was one of the longest continuous dataset of general practice in the world, with over 18 years of consecutive data (Table 1).[13] The BEACH dataset captured cross-sectional data about individual patient encounters coded using International Classification of Primary Care (ICPC)-2.[14] This paper-based survey tool was mailed out to randomly selected general practitioners (GPs) who completed the survey for 100 consecutive patient encounters. The surveys were then sent back to the central office for collation. The BEACH data were published in annual reports, as well as regular publications on specific topics. The dataset captured 96 500 patient encounters with 965 individual GPs in 2015–16.[13] The entire 18-year BEACH dataset contains information for approximately 1.8 million GP encounters from 10 789 individual GPs.[13]

The BEACH dataset has resulted in over 175 peer-reviewed articles and 140 commissioned articles in the academic literature.[13] The BEACH team has produced five doctoral candidates and the dataset is quoted ubiquitously by researchers throughout Australia in conference presentations and publications; the most recent 2015–16 handbook has over 950 citations alone.[13] Furthermore, the BEACH team has undertaken more than 1000 bespoke projects for government and non-government organisations,[13] making it one of the most influential datasets on Australian health policy.

TransHIS is an in-consultation data collection tool developed and used in a practice-based research network in the Netherlands since 1984 (Table 1).[15] TransHIS interacts directly with clinical desktop software and is currently used in six practices with 24 GPs in the Amsterdam and Nijmegen regions. The tool allows the clinician to code various aspects of the consultation to the ICPC-2 codes.[14] Data from each of the participating practices is then amalgamated centrally to make a dynamic dataset that currently has over 32 000 patients. There is up to 21 years of continuous data for some patients. The clinicians who use this system meet regularly to ensure the validity and consistency of their coding practices. The software developers are directly responsive to the needs of the clinician working in the consultation.

The TransHIS data has resulted in 325 academic papers,[16] and 13 doctoral students have completed their work based on the dataset. The Dutch government also uses TransHIS data in policy development. The TransHIS method and software have recently been used by Japanese GPs (KVB, pers. comm.), and this an ongoing area of development.

Although both the BEACH and TransHIS datasets are small compared with big data, they are both well aligned with national data on GP, patient and encounter characteristics.[13,15,17] The types of patients and GPs captured by the datasets mirror other national statistics that are available through funding statistics, suggesting that both datasets are representative of the national populations. The TransHIS dataset has the distinct advantage of capturing patient consultations over time because it is a longitudinal dataset.[18] Furthermore, every time a GP sees a patient, the encounter is coded as either a 'new problem' or 'follow-up'. This then allows the gathering of different consultations over time that are about the same clinical problem in an individual patient.[17]

Both the Netherlands and Australia have strong primary healthcare systems with general practice care a key feature. The Netherlands requires patients to register with a particular GP practice, whereas in Australia patients are free to visit any practitioner they choose. Australian general practice is funded by the national government, mostly as a fee for service, and GPs are able to charge a gap payment directly to patients on top of the

**Table 1. Comparison between the Australian Bettering the Evaluation and Care of Health (BEACH) and Dutch TransHIS general practice datasets, 2017**

EMR, electronic medical record; GP, general practitioner; ICPC-2, International Classification of Primary Care, 2nd edition

| | BEACH | TransHIS |
|---|---|---|
| Date data collection commenced | 1998 | 1984 |
| Date data collection ceased | 2016 | Ongoing |
| Type of data | Cross-sectional | Longitudinal |
| Reasons for encounter coded | Yes | Yes |
| Problems managed in each consultation coded | Yes | Yes |
| Are encounters classified as 'new' or 'follow-up'? | No | Yes |
| Total no. encounters | $1.8 \times 10^6$ | $1.7 \times 10^6$ |
| No. GPs | 10 789 | 24 |
| Patient encounters per GP | 100 consecutive patient encounters | Ongoing collection from data in EMR |
| No. individual patients | Unknown | 32 000 |
| Coding system used | ICPC-2 | ICPC-2 |
| Collection method | Paper-based surveys | Computer integrated with clinical software |
| Data availability | Publications plus directly from the research team at the University of Sydney | Online via free personal registration |

government rebate. In the Netherlands, general practice is funded through a mixture of fee for service and capitation payments through private health insurers, with the federal government providing insurance support for those unable to afford insurance premiums.

To demonstrate the use of these two datasets, herein we compare obesity management in general practice. Australia had an obesity prevalence of 27.9% in 2014–15,[19] similar to rates seen in North America, whereas the Netherlands had one of the lowest rates in Europe of 13.5% in 2015.[20] The aim of the present study is to contrast two general practice datasets from Australia and the Netherlands using the management of obesity as a case example.

## Methods

Published data on obesity from BEACH,[13] plus descriptive statistics from the BEACH data team at the University of Sydney, were used. Data were extracted from the TransHIS database using its bespoke descriptive software package. Both datasets use ICPC-2 for coding of a patient's reason for the encounter and the problems managed list, so a direct comparison was possible. The datasets allow comparison between 2000 and 2015 (until March 2016 for BEACH).

The TransHIS dataset is freely available to any individual after registration for a personal login. The BEACH dataset has been regularly reported on in detail, and a recent publication[13] was used for the present comparison. Information on the presentation of patients with obesity was provided by the BEACH team at the University of Sydney.

Descriptive statistics were used to compare the patient's reason for visiting the GP, the diagnosis given by the GP and the referral pattern for the consultation. Distribution graphs of patients coded with 'obesity' as a reason for encounter by age–gender distribution were produced using data provided by the BEACH team at the University of Sydney and data available from TransHIS.

The present case example was based on existing data and did not require ethics approval.

## Results

Using the data collected in general practice, in Australia, eight general practice consultations per 1000 patients (>18 years of age) per year are for obesity, compared with a rate of 6.77 per 1000 patients (>15 years of age) per year in the Netherlands.

From the cross-sectional BEACH data, we see that obesity is the most commonly referred chronic condition in Australia. Of consultations coded for obesity, 25% are referred to an allied health provider. In the Netherlands, 19.76% of consultations about obesity are referred to an allied health provider, with 11.57% of these occurring in the first encounter about obesity.

In the Netherlands, female patients present more often with obesity as an issue and most commonly in the 35–39 year age group (Fig. 1). In comparison, in Australia almost equal rates of men and women present to their GP with obesity as a presenting issue over all age ranges (Fig. 2).

Obesity did not make the list of the most common reasons for encounter in the BEACH publications. A subset of Australian patients had their self-reported height and weight recorded in 2015–16, regardless of their reason for presentation to the GP. In this group, one-third of patients (34.6%) had a body mass index in the healthy weight range, with overweight/obesity more commonly recorded in men (70.2%; 95% confidence interval (CI) 69.2–71.3%) than women (58.6%; 95% CI 57.5–59.6%). Overweight/obesity was most prevalent in the 65–74 year age group in both men (77.2%) and women (70.1%).

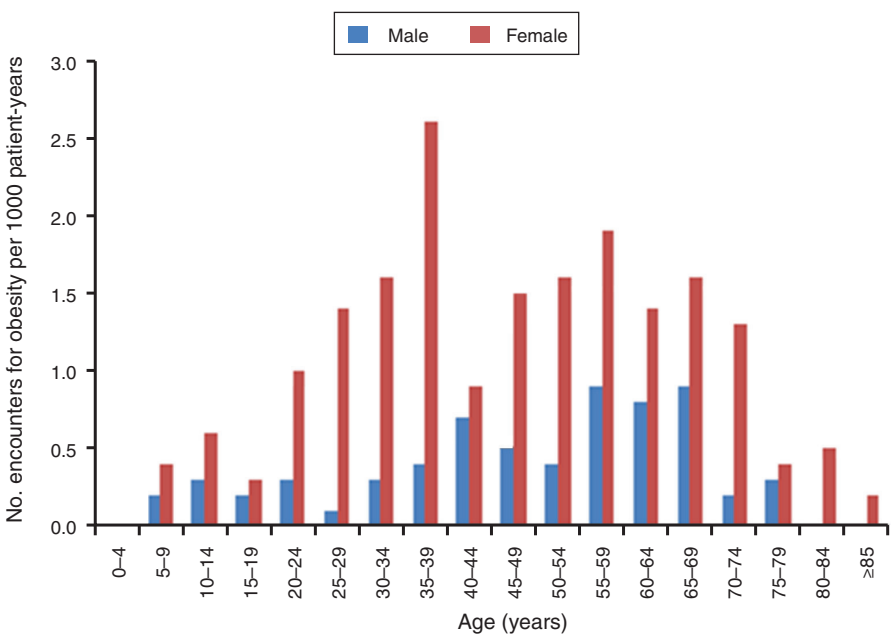


**Fig. 1.** Age distribution of patients presenting with obesity as the reason for the encounter in Dutch general practice (2000–15).

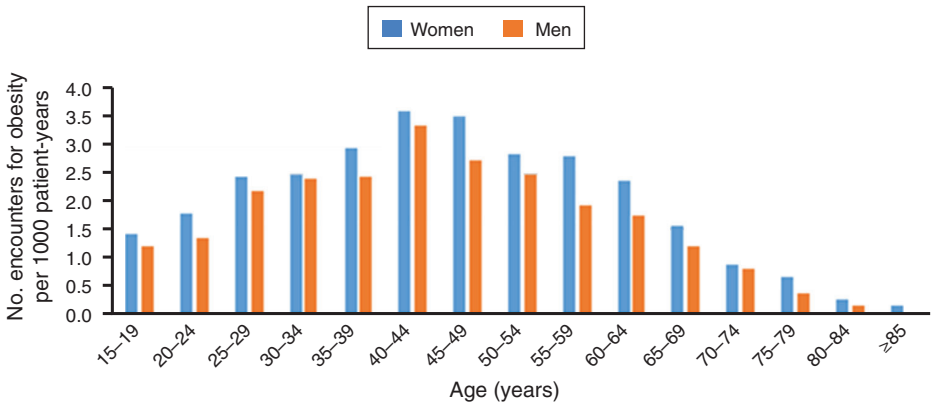


**Fig. 2.** Age distribution of patients presenting with obesity as the reason for the encounter in Australian general practice (2000–16).

Despite the different population prevalence of obesity in Australia and the Netherlands, the number of consultations per 1000 patients per year is similar. Patients with obesity are referred slightly more to allied health providers in Australia than in the Netherlands. Female patients in the Netherlands presented with the problem of obesity more often than men, but both men and women presented at equal rates in Australia. In Australia, self-reported height and weight in male patients gave a higher prevalence of obesity than women.

## Discussion

Both Australia and the Netherlands have high-quality, contemporaneous general practice datasets. This allows for direct comparison of the management of obesity, because the existing datasets use the same coding method of in-practice purposefully collected consultation information. Data collected within GP consultations are rare throughout the world.[1] This type of comparison will soon no longer be possible due to cessation of BEACH data collection.

Big data is excellent for information about the health of populations, but it does not give any data about individual consultations.[3] From population-level data, we cannot draw any conclusions about why people attend their GP, what happens in each consultation or how often people are referred or treatments are recommended.[21] Big data based on prescribing practices can provide information about medications, but does not capture non-pharmacological treatments. It is only with complete GP consultation data that we can understand the management of individual patients and the implications this has for primary healthcare service delivery.[21]

Australian studies of data extracted from electronic medical records show that weight and height are often not measured.[7,8] Although this reflects routine clinical practice, it is not helpful for determining obesity trends in Australian general practice, and BEACH filled this gap.[13] There is no ongoing data collection source that will continue to do this now that BEACH has ceased. It is possible that data extracted from routine electronic medical records will fill this gap over time, but this will not occur without significant investment into data quality and cleansing.[5,9]

Because BEACH is no longer collecting data, there are no contemporary Australian general practice datasets. There are silos of data in general practice; for example, Aboriginal Medical Services collect service data for government reporting requirements, corporate general practices collect their data for service improvement and the National Prescribing Service collects data on medication use. However, none of these covers the breadth of all general practice patients, the types of general practice care available and not all are universally made available to primary care researchers. Some practice-based networks are collecting deidentified general practice data from consultation records, but there are issues with ongoing data collection with loss of government funding for the primary health care research, evaluation and development strategy. Quality general practice data collection requires investment in clinician training and time for data entry, data cleansing and analysis,[5] little of which is currently available in Australia.

The unique feature of BEACH and TransHIS is the ability to focus in on single consultations and what occurs between the GP and patient. This type of information is essential for service planning and delivery. This obesity case example is the first time the Australian BEACH dataset has been compared with the Dutch TransHIS dataset. Obesity management is often included in the care of other conditions, such as diabetes or heart disease,[22] and the present case example only captures stand-alone obesity care. To improve the comparisons available in the international settings, funded collaborations between research teams would be useful.

Investment in GP-level data is being seen in the Netherlands through TransHIS and in the UK through the 'One in a Million' study.[1] It is recognised that the lack of data about GP consultations is having a detrimental effect on healthcare service planning as well as GP training.[1] To fill the gap left with the completion of BEACH, we need an ongoing focus on the GP consultation. Ideally, a model of longitudinal data collection, similar to TransHIS, would provide comprehensive data about the GP management of health conditions and outcomes for patients presenting with different symptoms.[15,20,23]

All Australian general practice research must start by understanding current management practices and, without datasets like BEACH, we will be unable to do this into the future. Without clinically driven relevant research we cannot begin to improve primary care practices, and this is a relevant goal for all primary care practitioners and patients. International primary

care networks recognise the value of consultation-level data, and Australia is stepping back without an ongoing commitment to collecting this information.[24]

## Competing interests

ES has no competing interests to declare. KvB is current project leader for TransHIS, but has no financial conflict of interest to declare.

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