Archwilio Cymru
Audit Wales

Checking the patients

Results from a pilot data matching exercise on GP patient lists

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What we looked at

1 We engaged with NHS Wales Shared Services Partnership (NWSSP) to carry out a data matching pilot exercise on General Practitioner (GP) practice patient lists. This short report summarises the results.

2 NWSSP provides a range of primary care services, including GP patient registration. Our exercise compared certain personal details for GP practices' permanently registered adult patients with other GP practice patient lists in Wales. It also compared those details with the UK Government's Disclosure of Death Registration records.

3 Our main aim was to detect any evidence of potential fraud and/or error. However, we also wanted to identify ways in which NHS Wales might need to improve its own processes around GP patient lists. The exercise did not cover all potential causes of list inflation. It focused on evidence of:

- duplicate patient registrations; or
- deceased individuals not removed from patient lists on a timely basis.

Why this is important

4 Independent partnerships of GPs run most GP practices in Wales. Health boards contract with these partnerships to provide services according to the General Medical Services (GMS) contract. The Welsh Government's revenue allocation for the GMS contract for 2024-25 was around £595 million. That allocation also supports those GP practices that health boards manage directly.

5 The GMS contract payment mechanism is complex, but the number of patients registered at a practice is at the heart of it. The amount paid per patient under the 'Carr-Hill formula' makes up most of a practice's income. This payment mechanism has an inherent fraud risk. Appropriate checks and balances on the accuracy of GP patient lists can help manage this risk.

6 As well as ensuring GP practices receive the correct funding, accurate patient lists support the wider management of primary care. They also help ensure the NHS provides timely access for services such as screening; preventing issues like patients who should not be registered blocking appointment invitations.

What we have found

7 We did not identify any immediate evidence of potential fraud in the areas covered by our work. We did, however, find a small number of errors.

8 The exercise identified just over 7,000 potential matches from around 2.7 million records processed. Most of the potential matches investigated by NWSSP – using a risk-based approach – have been explainable; that is, they were false positives. More specifically:

- We identified a relatively small number of duplicate patient registrations; 140 to date but with 395 potential matches still under investigation.
- Only a very small number of deceased individuals – 15 – remained on GP patient lists, but some had been left on those lists for a long time.
- The duplicate and deceased patient records identified mean that GP funding has been allocated inaccurately, but the sum involved is low.

9 Our results suggest patient list inflation controls in the areas covered by the exercise are generally sound. Nevertheless, NWSSP is working to enhance its overall central controls. There have also been recent wider IT system changes that cover England, Wales, and the Isle of Man.

What we recommend

10 We are not making specific recommendations in this report given our findings. Also, NWSSP has already taken learning from this exercise into its approach for checking patient lists and alongside other recent enhancements.

Auditor General's view

Data matching and other data analytic techniques are increasingly important as public bodies tackle risks around fraud and error. The results from this exercise have not identified significant concerns about the accuracy of GP patient lists and that is a good thing. But there is no room for complacency. I therefore welcome the way in which NWSSP has taken forward learning from this exercise as part of wider improvements it has already made.

Adrian Crompton
Auditor General for Wales

Key facts and figures

2.7 million – GP patient registrations processed in our data matching.

7,243 – data matches indicating potential duplicate registrations, including false positives.

140 – confirmed duplicate patient registrations.

395 – potential duplicate patient registrations still under investigation.

15 – patient registrations where deceased individuals had not been removed from GP patient lists.

Note: outcomes for confirmed duplicates, potential duplicates still under investigation, and deceased individuals are as at end of October 2025.

4 Our findings

We did not identify any immediate evidence of potential fraud but did find a small number of errors

We identified a relatively small number of duplicate patient registrations

11 The data matching included almost 2.7 million patient registrations. It has so far identified just 140 confirmed duplicate patient registrations. These have now been cancelled.

12 NWSSP has completed its review of the data matching results. As at the end of October 2025, 395 more potential duplicate patient registrations were with GP practices or the NHS Personal Demographics Service's (PDS) National Back Office for further investigation.[1] There is no pattern across the duplicate registrations identified, or those still under investigation, to indicate potential fraud within a specific practice(s).

13 The exercise provided potential duplicate patient registrations to NWSSP in two reports, based on the quality of the data match; that is, how closely the registrations compared to each other. NWSSP has investigated all patient registrations identified as potential duplicates in the high-quality match report. It has investigated around 10% of the medium-quality data matches.

14 **Exhibit 1** shows the number of data matches indicating potential duplicate patients. It also shows the investigation work NWSSP has carried out, the number of patient registrations cancelled, and the number still under investigation and referred to GP practices or the PDS National Back Office.

1 The PDS is the national master database of all NHS patients in England, Wales, and the Isle of Man. The PDS National Back Office manages NHS Numbers and PDS records. This includes investigating and resolving data quality incidents on PDS demographic records, such as duplicates.

Exhibit 1: duplicate patient registration data matches, their follow up, and outcomes reported as at end of October 2025, by match report[1, 2]

	'High quality' data match report	'Medium quality' data match report	Total
Potential duplicate patient registration data matches identified.	1,358	5,885	7,243
Potential duplicate data matches investigated by NWSSP.	1,358	608	1,966
Patient registrations cancelled.	127	13	140
Patient registrations still under investigation and referred to GP practices or to the PDS National Back Office.	246	149	395

Source: Audit Wales

Notes:

[1] The higher the quality of the match, the greater the assumed likelihood of a duplicate patient registration being identified, as also borne out by the investigation results.

[2] From 2,692,382 patient registrations processed.

15 As well as looking for exact matches of combinations of the data, such as patient name and date of birth, the exercise used other data matching techniques. These included 'fuzzy matching'. Fuzzy matching employs techniques to calculate the similarity between two registrations and determine whether they are likely to be the same person.

16 Fuzzy matching recognises similar but not identical matches. Examples include incomplete data, spelling variations, and words that sound alike when spoken. Fuzzy matching can produce false positive matches. NWSSP has taken learning from this element of this exercise into its approach for checking patient lists are accurate and complete.

Only a very small number of deceased individuals remained on GP patient lists, but some had been left on those lists for a long time

17 Matching patient list data against the UK Government's Disclosure of Death Registration scheme identified 15 instances where deceased individuals had not been promptly removed from GP patient lists. The date of death for those patients ranged between 2008 and 2023. As with the duplicate patient registrations, the results did not indicate any pattern to suggest potential fraud within a specific practice(s).

18 NWSSP's anti-list inflation controls include a bi-annual process that identifies very elderly patients. NWSSP then contacts GP practices to verify whether the patients are still alive. Our exercise generated a report identifying all patients over 100 years old. NWSSP's review of the report confirmed that all those patients were appropriately retained on practice lists, based on the data available at the time of extraction.[2]

The duplicate and deceased patient records identified mean that GP funding has been allocated inaccurately, but the sum involved is low

19 The way the funding formula works means that any duplicate and deceased patient records on patient lists will result in GP funding being incorrectly allocated to practices to some extent. That is, the overall distribution of GP funding would otherwise have been different.

2 At the time of setting up our data matching exercise, the age that NWSSP used for checking elderly patients are still alive was 100. For 2025-26, NWSSP has reduced the age to 95 and is considering a future reduction to 90 (see **paragraphs 24 and 27**).

20 The results from our exercise suggest that around £20,500 may have been incorrectly allocated to GP practices in 2024–25 because of the 140 duplicate and 15 deceased records identified to date. If all 395 potential duplicate records still under investigation are included, this figure rises to £72,600. We are not expecting that all 395 will necessarily prove to be duplicates, although they have been referred on because NWSSP itself has been unable to prove they are not.[3]

21 These financial figures are low when set against overall GP funding (see **paragraph 4**). Nonetheless, the existence of any of these records over multiple years means the cumulative effect is higher.

22 It is also likely that if NWSSP had investigated all medium quality matches, this would have identified further positive results. We recognise that NWSSP has taken a risk-based approach within available resources, including in how it approached the medium quality matches.

While our results suggest relevant patient list inflation controls are generally sound, NWSSP is working to enhance its overall central controls alongside wider IT system changes

23 Our exercise was limited in scope, and it is not just duplicate and deceased patients, or issues with the registration of elderly patients, that can lead to issues with the accuracy of patient lists. However, the results set out in **paragraphs 11 to 22** suggest NWSSP's patient list inflation controls are generally sound in the areas we covered.

3 We have based our estimates on a figure of £132 per patient but, in practice, the actual allocations to GP practices for these duplicate and deceased patient records will vary based on various factors (see **Appendix 2**).

24 Patient list inflation checks in NWSSP's 2025-26 work programme include:

- bi-annual checks of all patients over 95 years of age;
- annual review of the address status of patients flagged as students;
- rolling three-year review of addresses with more than 10 registered patients;
- a year after registration, confirming immigrant patients are still living at the same address;
- investigation every two to three months of children living at an address without a parent/guardian over 18 years of age;
- quarterly checks of patients recorded as deceased from Medical Examiner Service data; and
- because of our data matching exercise, quarterly checks to identify patient registrations where there are a few common or very similar demographic fields and then reviewing whether these are potential duplicates.[4]

25 Addresses with more than 10 registered patients can indicate patients registered who no longer live at the property which should have been cancelled or updated. To support NWSSP's rolling three-year review of addresses with more than 10 registered patients, we reported 1,175 such addresses to them.

26 Almost half of those properties were subsequently identified as nursing or care homes, and just over a quarter were houses in multiple occupation. NWSSP is working with GP practices to confirm the accuracy of their records where patients appear to be registered at temporary residences or in places where the number of residents appears excessive.

27 Enhancements to patient list inflation checks being trialled by NWSSP during 2025-26 include:

- checking and investigating patient status if the patient has not been seen within three years; and
- whether there is value in reducing the age for bi-annual checks for more elderly patients from over 95 years to over 90 years.

4 NWSSP first implemented this quarterly check in November 2024.

28 Recently, a new Primary Care Registration Management (PCRM) system has been implemented across England, Wales, and Isle of Man that registers patients with a GP practice. The PCRM system replaces five separate National Health Application and Infrastructure Services (NHAIS) platforms in Wales that previously managed primary care registration.

29 While we have not looked at its implementation, we understand that the PCRM system offers improved functionality, including real-time updates. To maximise its benefits, NWSSP is working with NHS England to enhance the system's reporting capabilities and streamline processes.

Appendices

1 About our work

2 Carr-Hill formula for GP funding

1 About our work

Scope of the audit

This all-Wales data-matching pilot exercise matched the personal details of adult – aged 18 and over – patients permanently registered on a Welsh GP's patient list with:

- all GP patient lists for Wales, to identify patients who have duplicate or multiple permanent GP registrations; and
- the UK Government's Disclosure of Death Registration scheme, to identify registered patients who are deceased.

The patient list data includes GP practices run by independent partnerships and those directly run by local health boards. The data has not been matched with equivalent datasets from England, Scotland, or Northern Ireland. The exercise will not, therefore, identify individuals registered with a GP in Wales who may also be registered with GPs in other UK nations.

The aim of the pilot was to detect evidence of potential practitioner fraud or error in 'inflating' patient registration lists in the areas covered. However, it did not cover all potential causes of list inflation. There was no intention to follow up any matches with individual patients.

We have considered what our results suggest about the quality of NWSSP's existing patient list inflation controls but have not tested those or any wider NHS Wales controls.

Audit questions and criteria

Questions

Our exercise was investigatory in nature. Its overall aim was to consider the following questions:

- Is there evidence of significant fraud or error in Welsh GP patient lists in terms of duplicate patient registrations or deceased persons not being removed from patient lists in a timely way?
- Do the results of the exercise suggest that NWSSP's existing patient list inflation controls are robust for the areas tested?

Criteria

This is what we considered 'good' would look like:

- The number of duplicate or deceased persons registrations identified is zero or low.
- There is no obvious pattern to the results that indicates potential fraud or common error by a particular GP practice(s).

Methods

Authorised users at NWSSP uploaded patient registration data to the National Fraud Initiative's (NFI) secure web application.[5] The NFI's data processing contractor, Synectics Solutions, processed and matched the data in the NFI web application. This included matching against UK Government Disclosure of Death Registration records already held in it.

Synectics Solutions provided NWSSP with reports containing matched records. These identified patient registration anomalies that could have indicated fraud or error. The match reports were made available to NWSSP for review and investigation through the NFI secure web application.

Processed data did not include any 'health data' or any other special categories of personal data. Data fields used were each patient's surname, forename(s), date of birth, gender, address, and NHS number, along with the GP practice code.

5 The NFI is a biennial UK-wide counter-fraud exercise. It helps prevent and detect fraud by electronically sharing and matching data sets. For more information about the NFI, see our report on the 2022-23 NFI exercise from October 2024.

2 Carr-Hill formula for GP funding

Most of a GP practice's income comes from a 'Global Sum' payment under the GMS contract. The payment is based on a sum for every patient on a 'weighted' practice list. An allocation formula, known as the Carr-Hill formula, is used to apply these weightings.

The formula directs resources to practices based on an estimate of a GP practice's patient workload. It considers factors such as:

- patient age and gender;
- additional needs of patients;
- patient list turnover;
- geographical variations in staff costs; and
- rurality.

The 2024-25 Global Sum payment per patient on a 'weighted' practice list was £132. It is £125.20 per weighted patient from 1 April 2025.

There are concerns in the health sector that the Carr-Hill formula is outdated, inequitable, and does not adequately reflect population healthcare needs. The Senedd's Health and Social Care Committee has been carrying out an inquiry into the future of general practice in Wales. The inquiry's terms of reference include the funding model for general practice.

In October 2025, the UK Government announced a review of the Carr-Hill formula for England, to deliver fairer distribution of funding and address health inequalities.

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