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Introduction

In this report, there are two focused analyses: dementia diagnoses across patient demographics as well as admissions and patient counts across National Healthcare Service (NHS) regions. The insights drawn from these two studies provide a clearer understanding of disease burden and healthcare demand within the NHS, supporting informed decision-making and regional planning.

Dementia Dataset and Task Overview

The NHS England dementia summary dataset was selected for this analysis due to its relevance, credibility, and comprehensive scope in addressing one of the UK's most pressing public health issues (NHS England, 2024c). Dementia is a rapidly growing cause of disability and mortality among older adults, and its societal impact is expected to intensify with the country's ageing population (Wang, Song and Niu, 2022). The summary dataset was downloaded from the official NHS website, is both current (2024) and credible, reflecting real-world clinical records and health service data. There are detailed insights into the types of dementia. It also contains variables that are directly relevant to individuals diagnosed with dementia, such as age and residential status. An exogenous dataset incorporated into this analysis is the global dementia death rate from the World Population Review (World Population Review, 2025). This addition was made to assess the broader international context and determine whether focusing on the UK constitutes a relevant and impactful case study.

Both datasets were provided in clean, structured Excel formats. The integrity of the source information was preserved as no additional rows or columns were added, and original column and row names remained unchanged. This high level of consistency ensured that the datasets were immediately ready for analysis. The two datasets were integrated using Tableau in the Data Source Pane. Tableau has a metadata feature which can be checked for null values. It was found that there were no null values, and all data points were unique, reflecting that there were no duplicate rows or columns. Tableau also allowed for seamless comparison and visualisation by combining national and international dimensions of the dementia landscape. This efficiency and reliability in data handling made the analysis both robust and efficient.

The charts and visualisations presented on the Tableau dashboard were carefully designed with the general public in mind. Each visual uses clear labels, consistent colour schemes, and intuitive layouts to make complex data easy to interpret without requiring technical expertise. The dashboard follows established principles of data visualisation, such as minimising clutter, emphasising key trends, and using appropriate chart types (e.g., pie chart for proportions, area chart for trends, bar charts for comparisons). Interactive elements, such as tooltips and filters, were incorporated to allow users to explore the data at their own pace. By avoiding jargon and presenting insights in a visually engaging format, the dashboard empowers users to better understand the scale, impact, and context of dementia in the UK. This approach supports the broader goal of raising awareness, encouraging early diagnosis, and fostering public engagement with a growing national health issue.

ICB of Responsibility Dataset and Task Overview

The NHS ICB of Responsibility dataset, sourced directly from the NHS England website, is highly relevant for country directors as it provides exhaustive insights into key operational indicators such as hospital admissions, mean wait times, and admission types across NHS Integrated Care Boards (ICBs) (NHS England, 2024a). This information is critical for identifying performance disparities, resource gaps, and systemic pressures. This will facilitate directors to make informed, data-driven decisions about where interventions, policy changes, or funding allocations are most needed (Karakolias, 2024). The dataset is of high quality, with all variables directly aligned with the responsibilities and oversight scope of NHS ICBs. It is well-structured, internally consistent, free from contradictions, and up to date (2023–2024), making it both reliable and actionable.

To enrich the analysis, two additional data sources were integrated. First, a population dataset from the Office for National Statistics (ONS) was used to compare patient counts against the total population in each NHS region, providing context on service utilisation and potential strain (ONS, 2024). Second, the 2024 NHS England workforce statistics were included to assess whether current staffing levels are sufficient to meet demand, based on both patient counts and regional population size (NHS England, 2024b). Together, these datasets offer a comprehensive view of healthcare capacity, helping directors evaluate regional performance in relation to available resources and population needs.

Substantial integration was carried out in Excel for cogent analysis and consistency. Excel was chosen due to its user-friendly interface and robust functionality. It includes a wide range of formulae that make merging datasets, cleaning entries and performing calculations both efficient and accessible. Three of the primary datasets were merged based on NHS regions so a comprehensive cross-comparison of patient counts, population figures and staffing volume could be conducted. None of the datasets had missing values. However, the gender field contained an “unknown” category which was assigned any value ranging from 1–5. These were addressed through a controlled Random Number Generation method in Excel. Due to the small volume of affected entries and the inconsequential values, there was no counterintuitive impact on the results. In terms of data transformation, some adjustments were necessary for clarity and uniformity. Of the 10 NHS regions included, four comprised multiple units which were aggregated into a single regional total to maintain consistency across datasets. Moreover, two column names in the workforce dataset were renamed to enhance clarity: “core training” was changed to “trainee doctors” and “special clinical assistants” to “elderly ward assistants.” A data reduction step was also applied, as only the top 10 among the original 42 NHS regions were retained. These were selected based on the highest number of hospital admissions and consultations. This allowed for a focused analysis of areas experiencing the most pressure and enabled a more targeted understanding of workforce shortages, patient demand and service delivery gaps across the highest-impact NHS regions.

The findings from these datasets were presented across three interactive dashboards to convey complex insights through advanced visualisations. As the country directors are attuned to advanced analytics and strategic planning, the dashboards employed a variety of sophisticated chart types, such as cluster plots, Pareto charts, heatmaps and scatter plots, to provide multi-

dimensional perspectives on patient volumes, workforce allocation, wait times and dementia care patterns. Treemap was also used and was particularly effective in visualising workforce and residential distribution, while heatmaps highlighted disparities in staffing levels and crisis response capacity across NHS regions. Scatter plot and area charts captured trends in dementia diagnosis over time, and bar charts facilitated direct comparisons between regions in terms of admissions and outcomes. Each visual element was selected for its analytical strength and its ability to support quick decision-making. The dashboards were structured to allow seamless navigation, clear filtering by region or indicator, and real-time interpretation of key metrics. This level of visual and functional design ensured that directors could rapidly identify areas of concern, assess regional performance, and prioritise interventions.

Analysis of Dementia in the UK

(Tableau Task Link)

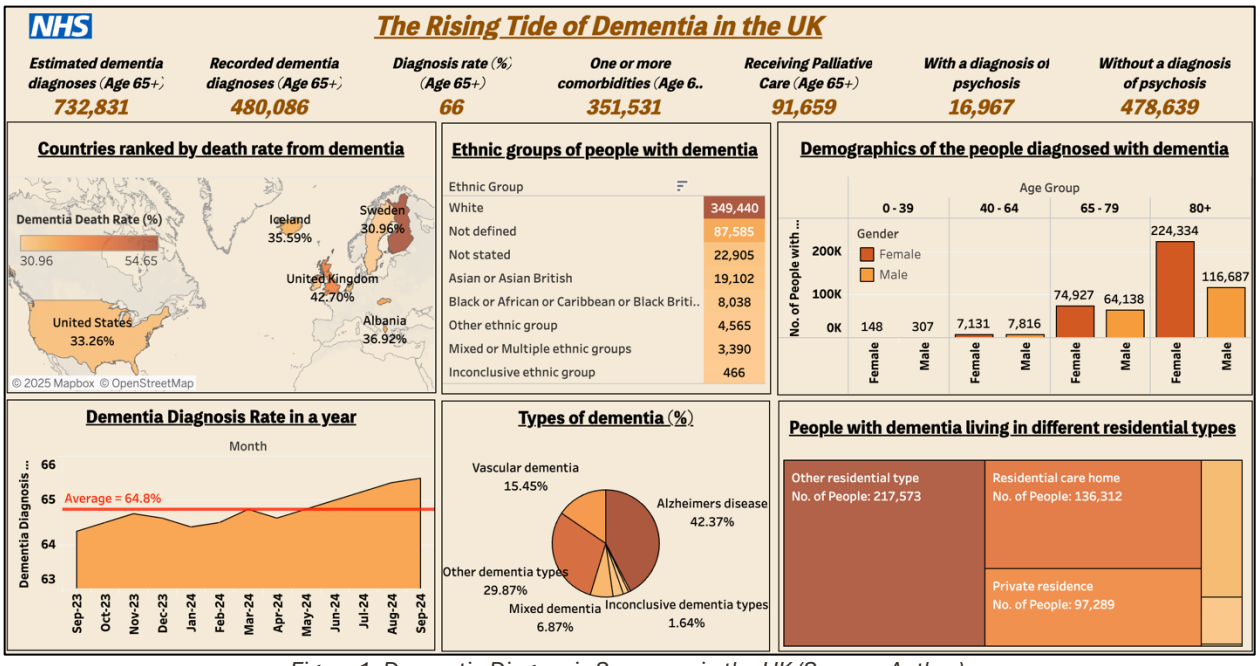

Figure 1: Dementia Diagnosis Summary in the UK (Source: Author)

The dashboard paints a picture of a growing and increasingly complex population of older adults living with dementia. From the map, we can observe that the UK has one of the highest rates of dementia globally. Dementia accounts for over 42% of deaths, making it an increasingly urgent public health concern. This alarming figure reflects the UK's rapidly ageing population and the growing strain on care services, families, and the NHS (McKee *et al.*, 2021). As more people live longer, dementia is emerging not just as a medical issue, but as a social and economic challenge that affects millions. Hence why, this report places special focus on the UK, aiming to understand the scale of the problem, identify gaps in care, and explore ways to better support patients, caregivers, and communities in facing this growing crisis.

The area chart illustrates the monthly dementia diagnosis rate in the UK over a one-year period, spanning September 2023 to September 2024. The data reveals a steady upward trend, with a prominent and consistent rise, beginning in April 2024. By September 2024, the diagnosis rate had reached 65.5%, surpassing the annual average of 64.8%. This gradual improvement may reflect enhanced public awareness, improved access to diagnostic services, and growing investment in memory clinics and primary care. However, despite the positive trajectory, the rate still falls slightly short of the NHS target of diagnosing at least two-thirds (66.7%) of people estimated to be living with dementia (Dementia Community, 2025). Therefore, there is a definite need for continued action. As the UK faces rising dementia prevalence in an ageing population, timely diagnosis remains essential for early intervention, effective treatment, and better support for families and caregivers.

The bar chart displays the demographic breakdown of people diagnosed with dementia by age group and gender. Across all age brackets, women consistently outnumber men in dementia diagnoses, with the disparity most pronounced in the 80+ age group, where females outnumber males by double. This trend is largely attributed to women's longer life expectancy, which increases their risk of developing age-related neurodegenerative conditions such as dementia. In the 65–79 age group, diagnoses rise sharply, with 74,927 women and 64,138 men affected. This stage underscores the importance of early detection, timely diagnosis, and intervention strategies. These demographic patterns highlight the need for gender-sensitive health policies, particularly in the planning and delivery of long-term care and community-based support services.

From the table displaying the ethnic breakdown of individuals diagnosed with dementia, revealing significant disparities in data completeness and ethnic representation. White individuals account for the vast majority of recorded dementia diagnoses (349,440 cases). The underrepresentation of non-White groups could point to barriers in dementia diagnosis, cultural stigma, or limited engagement with healthcare services. For public health officials, this highlights a pressing need to improve data quality, address potential diagnostic disparities, and ensure more inclusive dementia care pathways across all ethnic groups.

The pie chart presents the proportional breakdown of dementia types. The landscape of dementia is highly heterogeneous, with multiple coexisting or atypical presentations. Alzheimer's disease accounts for 42.37% of all dementia cases, making it the most prevalent type by a wide margin. It is succeeded by other dementia types (29.87%), which includes anything other than Alzheimer's disease, vascular dementia, Lewy body, frontotemporal dementia or mixed dementia. At 15.45%, vascular dementia is the third most prevalent type. Mixed dementia, where features of multiple dementia types are present, makes up 6.87%, highlighting the diagnostic complexity clinicians face, especially in older patients. Inconclusive dementia types (1.64%) reveal that for some individuals, even with thorough assessment, it remains challenging to determine the exact subtype.

This treemap visualises the number of people diagnosed with dementia living in different residential settings. The majority of dementia patients fall under the category of "other residential type," a designation used when a patient's most recent residential setting is not clearly recorded. This lack of clarity highlights gaps in data reporting and raises concerns about

oversight and support for individuals in non-traditional or transitional living arrangements. Meanwhile, 136,312 patients are living in residential care homes, reflecting a continued reliance on formal institutional care, while over 97,000 individuals remain in private residences, often relying on family members and unpaid carers for day-to-day support. In contrast, just 32,738 dementia patients live in nursing homes, which typically cater to those with more advanced needs. These figures underscore the importance of strengthening both institutional and community-based care services, improving data systems, and ensuring that all individuals with dementia, regardless of where they live, receive appropriate and consistent support.

The general info table presents key statistics related to dementia diagnoses and care for individuals aged 65 and over in the UK. The diagnosis rate for those aged 65+ stands at 66%, indicating that one-third of older adults with dementia remain undiagnosed. Out of an estimated 732,831 dementia cases in this age group, only 480,086 have a recorded diagnosis, revealing a substantial diagnosis gap that could hinder timely care and planning. More than 351,000 individuals aged 65+ with dementia have one or more comorbidities, highlighting the complex and often overlapping health needs of this population. This reinforces the need for integrated care pathways, as dementia rarely exists in isolation and often coexists with conditions like diabetes, cardiovascular disease, or frailty. Only 91,659 dementia patients aged 65+ have a record of receiving palliative care, a relatively low proportion given the progressive and terminal nature of the disease. This suggests a potential underutilisation of end-of-life support services, and calls attention to the importance of early palliative care integration to improve quality of life and reduce crisis-driven admissions. The recorded prevalence rate of dementia in the 65+ age bracket is a mere 4%. Additionally, there are 15,402 recorded cases of dementia among individuals under 65, confirming the presence of early-onset dementia. Among all recorded dementia diagnoses, 16,967 patients also have a diagnosis of psychosis, while the overwhelming majority (478,639) do not.

Analysis of Admitted Patients Care in the UK

(Tableau Task Link)

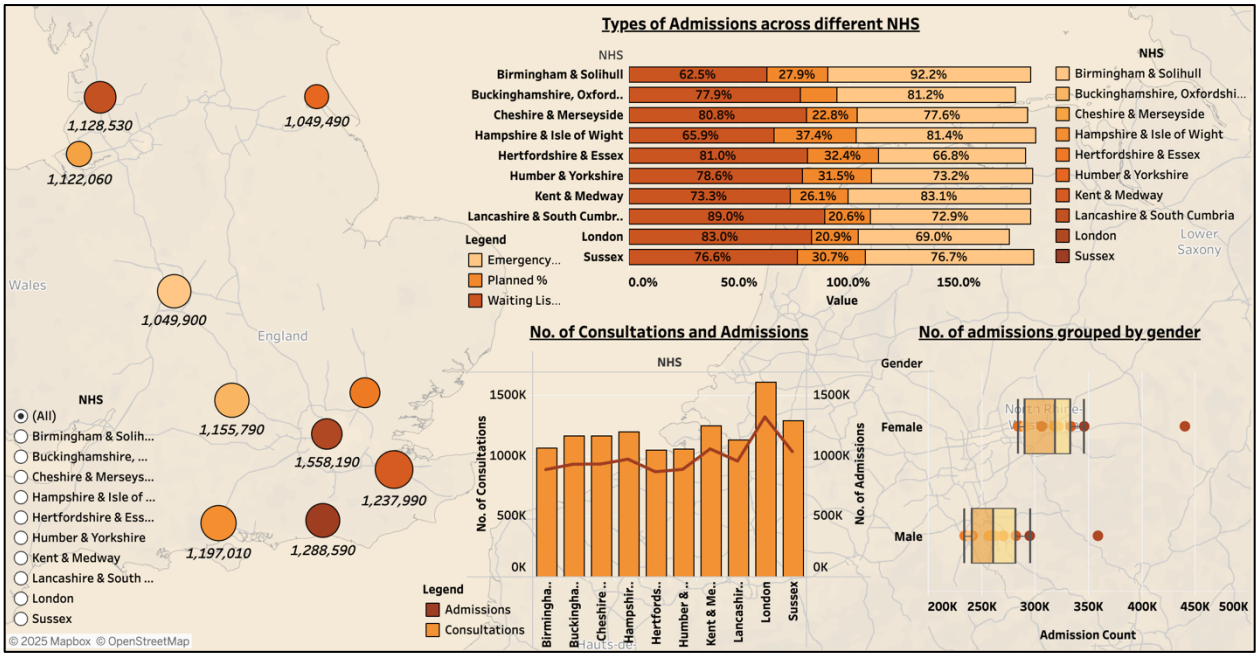

Figure 2: UK Hospital Demand Landscape (Source: Author)

The map shows the total number of patients across the top 10 NHS ICBs in England, based on hospital admissions and consultations. It can be observed that London has the highest patient count, closely followed by Kent & Medway.

The bar chart illustrates significant variation in consultations and admissions across ICBs. London leads in both metrics, while regions like Kent & Medway and Hampshire & Isle of Wight also report high consultation volumes. Cheshire & Merseyside and Buckinghamshire show high consultations but lower admissions, suggesting differences in care pathways or service accessibility. Country directors can evaluate regional service models and consider targeted investment in primary care to improve system balance and efficiency.

The stacked bar chart shows the distribution of Emergency, Planned, and Waiting List admissions across NHS regions. Emergency admissions are highest in Birmingham & Solihull (92.2%), Hampshire & Isle of Wight (81.4%), and Kent & Medway (83.1%). Meanwhile, a whopping 89%, 80.8%, and 81.0% of the patients of Lancashire & South Cumbria, Cheshire & Merseyside, and Hertfordshire & Essex respectively are plunged to the waiting list. Planned admissions are highest in Hampshire & Isle of Wight (37.4%) and Sussex (30.7%), suggesting more effective non-urgent care scheduling. Regions with low planned admissions may underutilise preventive services, increasing reliance on emergency care and worsening system strain (Berchet, 2015). To address these issues, country directors should prioritise strengthening primary care, expanding planned care capacity, and reducing elective care bottlenecks to shift away from reactive care models and improve long-term outcomes.

The box plot reveals higher female admission rates across NHS regions, likely due to greater use of gender-specific services. London is a clear outlier, with female admissions nearing 500,000, compared to 360,000 for males, highlighting disproportionate female healthcare use in urban areas. Male admissions are more consistent across regions, indicating more uniform service utilisation.

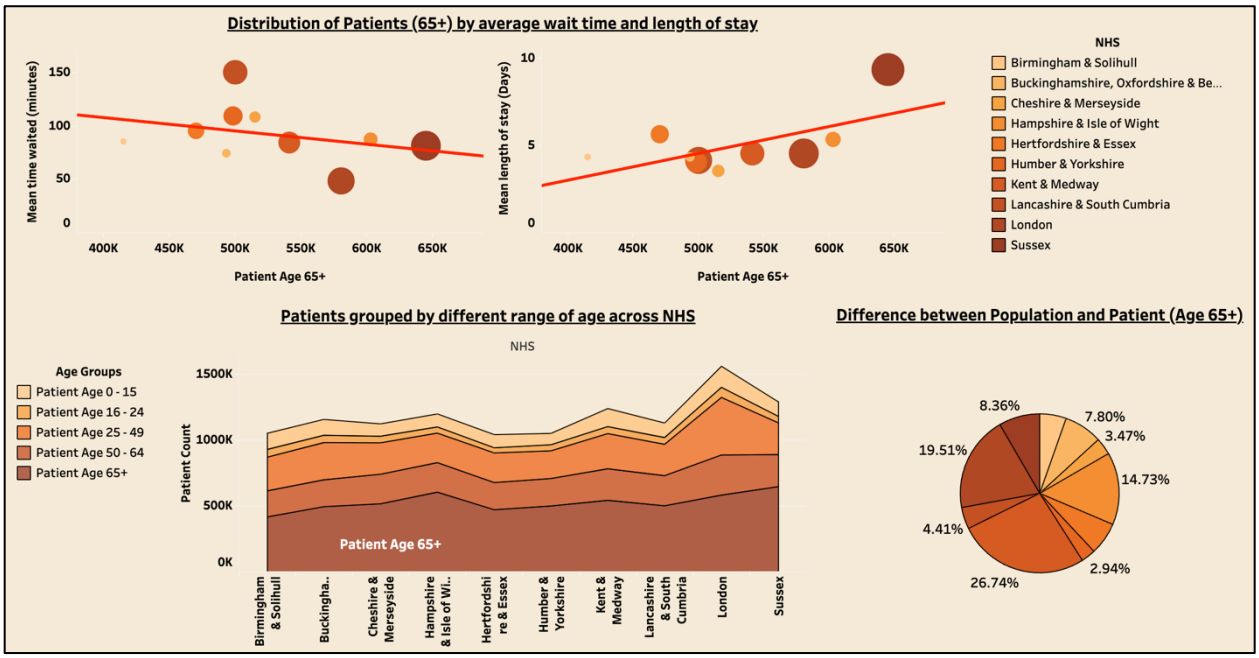

Figure 3: Understanding Demand based on Age Groups (Source: Author)

The area chart highlights that the 65+ age group consistently represents the largest share of patients across NHS regions. This should underscore the significant demand elderly care places on the system to country directors. Such patterns should prompt them to supply the regions that face greater pressure with beds, social care integration, and include chronic disease management.

The pie chart highlights the gap between total population and patients aged 65+ across NHS ICBs. Lancashire & South Cumbria, Cheshire & Merseyside, and Humber & Yorkshire show the smallest differences, indicating a high proportion of elderly patients and significant pressure on local healthcare systems.

The scatter plot shows that Lancashire & South Cumbria, Humber & Yorkshire, and Cheshire & Merseyside have the longest mean wait times for patients aged 65+, all exceeding 110 minutes. These delays may indicate limited capacity, staffing shortages, or poor care coordination for older patients. Public health directors should prioritise targeted interventions in these regions to improve outcomes and reduce delays.

The upward-sloping trend in this scatter plot line indicates that NHS regions with larger elderly populations tend to report longer average hospital stays. Sussex stands out with a mean stay nearing 9 days, while Hertfordshire & Essex also emerges as a key outlier. Prolonged stays are not only costly but can worsen health outcomes, while overly short stays may reflect discharge

pressures that risk readmissions. The latter creates a vicious cycle where patients are released prematurely, only to return to the system. Meanwhile, regions like Lancashire & South Cumbria, Humber & Yorkshire, and Cheshire & Merseyside, which report the highest mean wait times, may be failing to admit elderly patients in a timely manner, much less provide the duration of care they require.

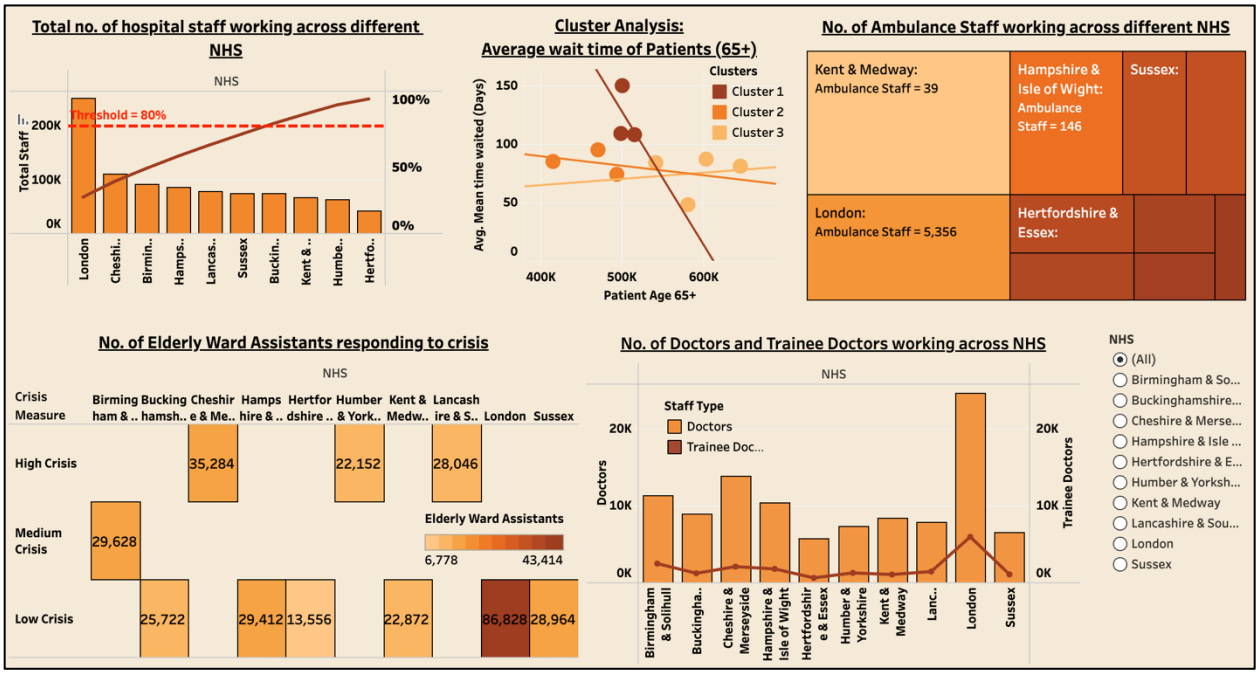

Figure 4: Hospital Resource Alignment (Source: Author)

The cluster analysis plot presents NHS regions based on the average time waited by patients aged 65+ against the total number of elderly patients. Lancashire & South Cumbria, Humber & Yorkshire, and Cheshire & Merseyside all fall into Cluster 1, characterised by exceptionally high average waiting times.

The heatmap shows the distribution of elderly ward assistants across NHS regions by crisis level. London, despite being in the Low Crisis category, has the highest number of staff, possibly due to proactive staffing, better equipment, or higher funding. Interestingly, regions like Lancashire & South Cumbria, Humber & Yorkshire, and Cheshire & Merseyside also have high staffing levels yet experience long wait times, suggesting inefficiencies or a mismatch between staff roles and elderly care needs. To address regional workforce imbalances, country directors should consider implementing a targeted staff redistribution strategy. Personnel from well-resourced regions such as London should be temporarily deployed to high-crisis areas with limited capacity. This approach should be supported by coordinated national workforce planning, flexible staffing frameworks, and sustained investment in training.

The treemap underscores the stark disparities in ambulance staffing. London surpasses other regions in this category. In contrast, regions like Lancashire & South Cumbria, Humber & Yorkshire, and Cheshire & Merseyside have low ambulance staffing. These regions coincide with ones which face high elderly waiting times and hospital strain. Consequently, country directors need to pivot their attention to strengthening emergency staffing in these areas. High-

capacity regions like London could serve as support or training hubs. NHS planning should prioritise emergency staffing ratios alongside elderly population needs to improve system responsiveness.

Once again, London leads significantly with the highest number of doctors and trainee doctors, reflecting strong clinical capacity and a robust training infrastructure, likely supported by major teaching hospitals. In contrast, Sussex appears under-resourced, which has most likely contributed to its high mean length of stay. Regions like Lancashire & South Cumbria, Humber & Yorkshire, and Cheshire & Merseyside have moderate doctor numbers and relatively few trainees despite large, aging populations. This suggests workforce shortages, limited succession planning, and increasing pressure on senior personnel. These same regions also report high wait times for patients aged 65+ and low ambulance staffing, indicating systemic bottlenecks, including delayed admissions and prolonged hospital stays. Cheshire & Merseyside, while having more doctors, still has a modest trainee cohort, raising concerns about future capacity. Additionally, the available staff may not be adequately specialised in geriatric care. Collectively, these regions face a triple challenge: limited clinical staffing, weak training pipelines, and rising elderly demand, driving persistent delays and highlighting the need for targeted investments in workforce development and emergency support.

The Pareto chart shows that a small number of NHS regions hold the majority of hospital staff, with London alone accounting for 252,310, far surpassing others. Regions like Kent & Medway, Humber & Yorkshire, and Hertfordshire & Essex lag behind, contributing to longer wait times, staff burnout, and elderly care challenges. High staffing levels in London and Cheshire may reflect centralised specialist and tertiary services.

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