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Keywords

Inequalities; life expectancy; public health

Abstract

Objectives

The COVID-19 pandemic in Wales and the UK has highlighted significant and historic inequalities in health between social groups. To better understand the composition of these inequalities and inform planning post-pandemic, we undertook a decomposition of life expectancy inequalities between the most and least deprived quintiles for males and females by age and cause of death, and explored trends between 2002 and 2018.

Study design

Age:cause decomposition of life expectancy inequalities using routine population and mortality datasets.

Methods

We used routine statistics from the Office for National Statistics for the period 2002-2018 on population and deaths in Wales stratified by age, gender, Welsh Index of Multiple Deprivation (WIMD) 2019 quintile and cause of death, categorised by ICD-10 code into 15 categories of public health relevance. We aggregated data to 3-year rolling figures to account for low numbers of events in some groups annually. Next we estimated life expectancy at birth by quintile, gender and period using life-table methods. Lastly, we performed a decomposition analysis using the Arriaga method to identify the specific disease categories and ages at which excess deaths occur in more disadvantaged areas, to highlight potential areas for action.

Results

Life expectancy inequalities between the most and least WIMD quintiles rose for both genders between 2002-2018: from 4.69 to 6.02 years for females (an increase of 1.33 years) and from 6.34 to 7.42 years for males (an increase of 1.08 years). Exploratory analysis of these trends suggested for females, respiratory disease (1.50 years), cancers (1.36 years), circulatory disease (1.35 years) and digestive disease (0.51 years) were the most influential. For males the gap was driven by circulatory disease (2.01 years), cancers (1.39 years), respiratory disease (1.25 years), digestive disease (0.79 years), drug- and alcohol-related conditions (0.54 years) and external causes (0.54 years). Contributions for females from respiratory disease, cancers, dementia and drug- and alcohol-related conditions appeared to be increasing, while among males there were rising contributions from respiratory, digestive and circulatory disease.

Conclusions

Life expectancy inequalities in Wales remain wide and have been increasing, particularly among women, with indications of worsening trends since 2010 following the introduction of fiscal austerity. As agencies recover from the pandemic these findings should be considered alongside any resumption of services in Wales or future health and public policy.

Introduction

The COVID-19 pandemic has had stark effects on population health in Wales and the UK, with sizeable increases in all-cause mortality above expected levels witnessed in many regions across the country.[1] Furthermore, it would appear that levels of mortality from COVID-19 have been significantly higher in more deprived areas, [2] and there have also been increases in mortality from causes other than COVID-19, for example due to decreased presentation to health services.[3] The public health response to the pandemic has inevitably impacted on the wider social and economic determinants of health. While such analyses remain provisional, there may in fact, depending on the direction the pandemic takes and our collective response, be lasting impacts of the pandemic on overall life expectancy and health inequalities for years to come.[4]

A pre-pandemic examination of population health in Wales revealed stark inequalities and challenges to overcome: gains in life expectancy since 2011 had broadly stalled since the previous decade;[5] socioeconomic differences in mortality appeared to increase in recent years,[6] particularly among older age groups; while rates of improvement in middle-ages had plateaued.[7] While several explanations have been advanced to explain such trends,[8] many, including the most recent Marmot Review,[9] have emphasised the key role of reductions in public spending since 2010 under the policy of so-called 'austerity' in widening inequalities, with a number of indicators seen as key to improving health and equity worsening significantly in recent years.[9]

Inequalities in health are shaped by the environments in which people are born, live, work and age.[10] Effective solutions to tackling health inequalities however require a sophisticated understanding of their composition, if we are to deliver interventions at the right time, place and to the right people. Though existing analyses have documented significant inequalities in life expectancy in Wales,[11,12] with some insights from recent research into specific causes of this,[13] conventional analysis has focussed on trends by disease and risk factor, [14] compared to a comprehensive deconstruction of how life expectancy inequalities are composed. To the best of our knowledge there has been no investigation of the contribution of deaths among specific age groups and from specific causes of death to life expectancy inequalities in Wales, though similar analyses have been undertaken in England,[15] Scotland[16] and elsewhere.[17,18,19,20]

We aimed therefore to explore the drivers of life expectancy inequalities in Wales pre-COVID-19 by undertaking a decomposition by age and cause of death and by exploring trends over time to identify areas for action. In this present study we illustrate areas in which there have been progress and causes for some of the adverse trends described above, many of which pose particular vulnerabilities in the context of the COVID-19 and any future infectious disease pandemics.

Methods

Data sources

We obtained Welsh mid-year population and mortality data for all deaths occurring between 2002 and 2018 for Lower Super Output Areas (LSOAs - statistical small area units of around 1500 population), categorised by quintile of Welsh Index of Multiple Deprivation (WIMD) 2019. WIMD is the Welsh Government official measure of relative deprivation for small areas, based on a composite of multiple sub-domains including income, employment, health, education, access to services community safety, environment and housing.[21] Data were grouped into quintiles of deprivation based on the overall ranked WIMD score of LSOAs in 2019: quintile 1 denotes the most deprived 20% of LSOAs and quintile 5 the least deprived 20% of LSOAs. The most deprived LSOAs (n=382) were predominantly in the area of the south Wales valleys region, an area of significant

deindustrialisation and subsequent high unemployment, with further pockets in Cardiff, Newport, and west and north Wales (see map in Supplementary Appendix 1). The least deprived (n=381) LSOAs in contrast were more dispersed in areas of north Wales, the rural Vale of Glamorgan, Monmouthshire and Cardiff. Deaths in each quintile were further stratified by 5-year age-group, gender and underlying cause of death, using the underlying International Classification of Disease version 10 (ICD-10) code attributed to each death and a categorisation approach that grouped similar causes of death together in categories relevant to public health action (see supplementary Appendix 2). We performed decomposition using both a broad cause of death categorisation and a narrower model that enabled a more granular analysis of condition-specific mortality patterns.

Statistical methods

Given the relatively small size of the Welsh population (approx.3.1 million), some causes of death in specific age categories risked having a low number of annual deaths. We therefore aggregated data into rolling 3-year figures to partially account for this and opted to focus our analysis among WIMD quintiles, in contrast to wider research which tends typically to utilise deprivation deciles.[15] Thereafter we used Chiang[22] and Silcocks[23] life-table methods to produce life expectancy estimates by gender, period and deprivation quintile. We calculated absolute life expectancy inequalities between based on the absolute gap between the most (quintile 1) and least (quintile 5) deprived 20% of LSOAs and also relative inequalities based on the ratio of difference of life expectancy between quintiles. Thereafter we performed a decomposition of absolute inequalities using the Arriaga method.[24] This technique compares the mortality experience of two populations using age-specific and age-cause-specific mortality rates to calculate the contribution of deaths among specific age-groups and from specific causes to life expectancy inequalities. While we are aware of one study to decompose more contemporary, robust measures of inequality such as slope and relative indices of inequality (SII/RII),[16] such analyses have applied less-used demographic approaches, whereas most decomposition research has utilised absolute gap measures.[15,25,26] While SII/RII are more academically appealing, there may be some comparability between such measures and absolute/relative gap measures,[27] while the latter are arguably easier to comprehend for the public. Analysis was undertaken using R software for Windows (version 3.6.1) using the Tidyverse,[28] Patchwork[29] and Viridis[30] packages. Open-source code is available online at https://github.com/jonny-currie/welsh_ineq.

Results

Trends in life expectancy inequalities 2002-2018

Life expectancy rose throughout the period across all quintile. However, whereas those in the least deprived quintiles saw generally steady increases, life expectancy in the most deprived quintiles after 2012-14 steadily fell, reducing gains in the years prior to that period (see figure 1). Female life expectancy at birth in the most deprived areas rose from 77.86 years in 2002-04 to 79.06 years in 2016-18 (an increase of 1.2 years), while for females in the least deprived areas the rise was from 82.55 years to 85.08 years (an increase of 2.53 years). Life expectancy at birth for males in the most deprived areas rose from 72.27 years in 2002-04 to 74.24 years in 2016-18 (an increase of 1.97 years), whereas for males in the least deprived areas during the same period life expectancy rose from 78.62 to 81.65 years (an increase of 3.03 years). As the graphs in figure 1 illustrate, life expectancy gains since around the turn of the last decade have slowed significantly, with life expectancy for the bottom quintile persistently worsening for the most recent four rolling-periods.

Figure 1 – Trends in life expectancy at birth for males and females in Wales, by WIMD 2019 quintile, 2002-18, with 95% confidence interval error bars. Dotted-line shows start of austerity period.

Figure 2 shows trends in the absolute inequality gap in life expectancy at birth for both females and males in Wales for the same period: for females, the gap in life expectancy between the most and least deprived quintile rose from 4.69 years in 2002-04 to 6.02 years in 2016-18, an overall rise of 1.33 years. Among males, the gap in life expectancy between the most and least deprived quintile rose from 6.34 years in 2002-04 to 7.42 years in 2016-18, an overall rise of 1.08 years. Relative inequalities in life expectancy rose for both genders throughout this period: from 6% to 7% for females and from 8% to 9% among males.

Figure 2 – Trends in the absolute gap in life expectancy at birth between the most and least deprived population quintiles for females and males in Wales by WIMD 2019 score, 2002-18. Error bars show 95% confidence intervals.

Exploration of current life expectancy inequalities by age- and cause

Figures 3 and 4 illustrate the output of the decomposition analysis for the most recent period available from the analysis (2016-18) for inequalities in female and male life expectancy by age-group and cause of death. Female life expectancy inequalities in 2016-18 (total gap = 6.02 years) were driven largely by 4 groups of conditions: respiratory disease (1.50 years, particularly among 60-89 years); cancers (1.36 years, 55-79 years); circulatory disease (1.35 years, 60-84 years); and digestive disease (0.51 years, 40-44 years, 50-69 years and 75-79 years). Exploration of these patterns indicated chronic respiratory disease (0.93 years) and influenza/pneumonia (0.46 years) accounted for 93% of the gap contribution from respiratory disease; lung cancer (0.67 years) accounted for 49% of the gap contribution from cancers; ischaemic heart disease (0.67 years) and cerebrovascular disease (0.26 years) accounted for 69% of the gap contribution from circulatory diseases; while liver disease (0.23 years) accounted for 45% of the gap contribution from digestive diseases (see supplementary appendix 3).

Male life expectancy inequalities in 2016-18 (total gap = 7.42 years) in contrast were predominantly driven by greater levels of mortality in the most deprived quintile from 6 groups of conditions (contributions in brackets followed by key age-groups): circulatory disease (2.01 years, 50-79 years); cancers (1.39 years, 60-79 years); respiratory disease (1.25 years, 65-84 years); digestive disease (0.79 years, 40-64 years); drug- and alcohol-related conditions (0.54 years, 25-44 years); and external causes (0.54 years, 25-49 years). Exploration of these patterns indicated ischaemic heart disease (1.23 years) and cerebrovascular disease (0.28 years) to account for 75% of the total gap contributed by circulatory disease; lung cancer (0.70 years) accounted for around 50% of the gap contribution from cancers; chronic respiratory disease (0.74 years) and Influenza/Pneumonia (0.36 years) accounted for 88% of the gap contribution from respiratory disease; and liver diseases accounted for 65% of the gap contribution from digestive disease (appendix 3).

Figure 3 - Summary of female age- and cause-decomposition of life expectancy inequalities between most and least deprived quintiles in Wales, 2016-18. Heatmap (bottom-left) shows contribution to overall life expectancy inequality by age (x-axis) and cause (y-axis) with colour legend (top-right); bar-chart (bottom-right) shows overall contribution by cause while bar-chart (top-left) shows overall contribution by age-group.

Figure 4 – Summary of male age- and cause-decomposition of life expectancy inequalities between most and least deprived quintiles in Wales, 2016-18. Heatmap (bottom-left) shows contribution to overall life expectancy inequality by age (x-axis) and cause (y-axis) with colour legend (top-right); bar-chart (bottom-right) shows overall contribution by cause while bar-chart (top-left) shows overall contribution by age-group.

Exploring trends in contribution by age- and cause to life expectancy inequalities between 2002-2018

Figures 5 and 6 summarise the changes in contribution to the life expectancy gap for females and males between 2002-04 and 2016-18, by age-group and cause of death. The increase in life expectancy inequalities for females of 1.33 years appeared driven by increasing contributions from respiratory disease (0.68 years), cancers (0.32 years), dementia (0.14 years) and drug- and alcohol-related conditions (0.14 years). For males, the increase of 1.08 years appeared driven by increasing contributions from respiratory diseases (0.38 years), digestive disease (0.29 years) and circulatory disease (0.16 years), with a smaller contribution from cancers (0.10 years) and drug- and alcohol-related conditions (0.10 years). Some trends were more favourable with the contribution to the life expectancy gap from infections, neurological conditions and external causes decreasing between 2002-04 and 2016-18 for males, and circulatory causes for females.

Further exploration of these changes (appendix 3) among females indicated that the increase in contribution from respiratory diseases was driven by influenza/pneumonia (0.32 years, 47%) and chronic respiratory diseases (0.30 years, 44%) and lung cancer accounted for 0.19 years (59%) of the increase in contribution from cancers. For males, of the 0.38 year increase in life expectancy gap contribution from respiratory diseases, 0.21 years (55%) was accounted by an increase in the contribution from influenza/pneumonia and 0.16 years (42%) from chronic respiratory disease. Contributions from IHD among males reduced by 0.06 years, though this was offset by increases in contributions from other circulatory conditions (0.21 years) and cerebrovascular disease (0.04 years). An increase in the contribution to male life expectancy inequalities from liver disease of 0.17 years accounted for 58% of the increase in the contribution from digestive diseases.

Figure 5 - Summary of age- and cause-decomposition of change in life expectancy gap between most and least deprived quintile among females between 2002-04 and 2016-18. Heatmap (bottom-left) shows change during period to change in overall life expectancy inequality by age (x-axis) and cause (y-axis) with colour legend (top-right); bar-chart (bottom-right) shows overall change in contribution by cause while bar-chart (top-left) shows change in contribution by age-group.

Figure 6 - Summary of age- and cause-decomposition of change in life expectancy gap between most and least deprived quintile among males between 2002-04 and 2016-18. Heatmap (bottom-left) shows change during period to change in overall life expectancy inequality by age (x-axis) and cause (y-axis) with colour legend (top-right); bar-chart (bottom-right) shows overall change in contribution by cause while bar-chart (top-left) shows change in contribution by age-group.

Discussion

Summary of findings

This study has explored trends in absolute life expectancy inequalities in Wales pre-COVID-19 in order to understand the specific diseases and age-groups driving gaps in life expectancy between socioeconomic groups. Improvements in life expectancy overall stagnated from around 2011-12, shortly after the introduction of austerity policies across the UK, with life expectancy in the most deprived areas showing a concerning decrease for males and females. Absolute inequalities in life expectancy at birth for females rose throughout this period, from 4.69 years in 2002-04 to 6.02 years in 2016-18, while among males there was a smaller but still significant increase from 6.34 years in 2002-04 to 7.42 years in 2016-18. Relative measures of life expectancy also rose throughout this period. For females, deaths from respiratory, circulatory and digestive conditions in addition to cancers played the most significant role in the most recent period of 2016-18, while among males, changes appeared particularly driven by deaths from circulatory, respiratory and digestive conditions, cancers, substance misuse and poisonings/injuries. Rising life expectancy inequalities between 2002 and 2018 appeared to be driven by deaths from respiratory, digestive and circulatory conditions among males, and by respiratory disease, cancers, dementia and substance misuse among females. The significant contribution from respiratory diseases to the gap, particularly among females, may be further compounded by the COVID-19 pandemic, both given the greater risk among those with chronic respiratory conditions and the direct effect of COVID-19 as an acute respiratory disease.

Such findings must be seen in context in light of the considerable budgetary cuts in Wales since 2010 under a programme of austerity by the UK government in the response to budgetary deficits following the financial recession of 2007-08. Between 2010-2019, grants to Wales from the UK Treasury Department fell by an average of 0.6% each year, in comparison to 4.4% average annual increases between 2001-2010.[31] Such fiscal pressures have significantly impacted the key determinants of health through adverse impacts on work, education, living conditions and public services.[9,32] Significant in this period has been loss of economic and social safety nets, worsening trends on several key indicators relating to the wider determinants of health in Wales and reductions in investment in public services; thus, while our analysis does identify a number of avoidable causes of death from cardiovascular, smoking, alcohol- and drug-related causes and external injuries, responses to such findings need to go beyond those focussed on the individual and include policies to improve the social conditions that create such inequalities, in addition to increases in the prevention, identification and management of disease.

Comparison with other studies

Our findings are further strengthened by a number of similar conclusions by other authors of UK-based decomposition research. Bennett and colleagues estimated life expectancy inequalities among males and females in England to rise between 2001 and 2016 with comparable disease and age-group influences, though the size of their cohort allowed analysis between deciles.[15] While their study employed a somewhat clinical death categorisation approach, their findings of conditions driving the gap in life expectancy in England largely replicated our own. Ramsay and colleagues undertook a decomposition of overall life expectancy in Scotland between 2000 and 2017, finding rising contributions to reduced life expectancy during the period from drug-related deaths and dementia.[33] Their study also identified stalling increases in life expectancy in recent years, with declining improvements from circulatory causes appearing to be key, in addition to increasing deaths from drug-related causes and also dementia. Seaman and colleagues[16] undertook a decomposition of the lifespan variation gradient, another measure of inequality: between 1981 and 2011 they found circulatory and external causes of death to be particularly influential in steepening the lifespan variation gradient, particularly among males. Thus, while studies have differed in their

methodology, with no other published study to date in Wales, our findings mirror that of many others from across the UK finding deteriorating trends in life expectancy and inequalities, with several common conditions underpinning these patterns.

Strengths and limitations of our analysis

We believe our study benefits from a number of key strengths which add value to existing literature. Firstly, we used the most contemporary mortality and population data available prior to the COVID-19 pandemic and reported by the ONS, making this a novel analysis to understand population health pre-pandemic. Our use of consistent deprivation ranking using the latest Welsh Index of Multiple Deprivation (2019) classification and consistent geographical units should strengthen the validity of reported trends in inequalities over time. Furthermore, we employed a hierarchy of classifying causes of death using ICD-10 codes aligned with public health action, developed and in use by two of the four UK public health agencies.

Our study does however have a number of limitations to consider. Firstly, we rely on accurate death registration as issued by health professionals involved in identifying a putative cause. Exploratory work by the ONS[34] suggested medical examination did amend the cause of death for a number of conditions which may give the relatively low rate of post-mortems in England and Wales[35] have implications for the accuracy of mortality data we used. However, this misclassification is unlikely to be associated with socio-economic status and therefore is likely to introduce bias towards the null, resulting in an underestimation of the observed difference in life expectancy between quintiles.

Secondly, we were not able to undertake an exploratory analysis to understand the reasons for the trends reported. One study by Leon and colleagues of life expectancy trends across 22 high-income countries hypothesised recent adverse life expectancy trends in England and Wales seen particularly among females may be in part accounted by the higher smoking rates seem among women during the 20th century than in other countries, though this clearly does not explain the full patterns in our study. Related to this limitation is the focus on deaths occurring at an individual level; given inequalities are shaped by determinants at community, national and global levels, this analysis should not prejudice readers to adopting a singular focus on risk factors and causes affecting individuals, when wider macro-economic and structural determinants likely play as much or greater influence.

Thirdly, we were unable to report on uncertainty levels in our decomposition estimates in the form of confidence intervals, due to a lack of validated methods for calculating standard error of decomposition analyses. Our attempt to address this limitation through aggregation of data to 3-year rolling figures, 5-year age-groups and the use of quintiles should strengthen the robustness of our conclusions. However, without validated methods to calculate standard errors of such output, uncertainties will remain unclear, while performing such analyses at sub-national level may also remain elusive.

Finally, our analysis given its focus on life expectancy inequalities does not capture diseases that will contribute to high levels of morbidity in the population. Mental illness and musculoskeletal conditions for instance, among many others, would likely shape healthy life expectancy in Wales but given the data needed to decompose healthy life expectancy through age-specific prevalence rates, we opted to focus on mortality and life expectancy alone. Further work should explore the contributions to healthy life expectancy inequalities, where there is sufficient data.

However, these limitations notwithstanding, given the relatively small number of similar studies undertaken to date using this approach, our application of a public health-based classification of

causes of death, both by broad condition groups and also a subgroup analysis, and finally the implementation of this study using the timeliest of mortality data available pre-COVID-19, we believe our findings are of significant value in policy, service planning and academic circles and believe our conclusions could guide future planning and service delivery, as well as potentially informing future discussions on any recovery post-COVID-19.

Implications of our findings

Tackling health inequalities has been a priority of the Welsh Government since devolution, clearly emphasised in recent legislation including the Wellbeing of Future Generations (Wales) Act[36] which places a duty on public sector organisations to prioritise wellbeing and prevention, and 'A Healthier Wales', the Welsh Government programme for Health and Social Care.[37] Data by 2019 however showed worsening trends for life expectancy inequalities in Wales among males and particularly among females.

This analysis has identified key areas in which targeted action could ameliorate some of these worsening gaps: in prevention, smoking remains clearly a major determinant of ill-health in Wales and ought to remain a key priority in tackling inequalities; further determinants identified by this analysis include risk factors for cardiovascular disease and cancers including therefore diet, physical activity and early recognition of symptoms and diagnosis. The contribution of drug and alcohol misuse to inequalities must also be considered in both policy and service planning, as must the effects of mental health and intentional or unintentional injuries, given their contribution to these inequalities through poisonings and external causes of mortality. Where evidence supports improved case identification to address health inequalities, programmes should be delivered in the principle of proportionate universalism to support better early identification and treatment for disease, including via cancer screening and wider health services.

More broadly however, this analysis illustrates the importance of investment and policy upstream on the underlying determinants of health equity, requiring greater redistribution of income and opportunities among socioeconomic groups, alongside improvements to living conditions in disadvantaged areas that negatively affect health. Such findings are all the more relevant given the impact COVID-19 has had on mortality among the most disadvantaged social groups and the effects of the pandemic and response on socioeconomic trends. By mid-July 2020 the rate of mortality from COVID-19 in the 20% most disadvantaged areas was nearly double (age-standardised rate 117.1 (95% CI 107.6-127.1) vs 62.5 (95% CI 56.9-68.4) per 100,000) that of the 20% least deprived areas.[38] An analysis of life expectancy in England and Wales during the COVID-19 pandemic suggested significant reductions in life expectancy with some reduction in lifespan inequality, though authors cautioned drawing conclusions at so early a point in the pandemic's trajectory.[39] Higher rates of long-term conditions, poorer housing conditions and economic pressures to continue working during the lockdown in the UK are likely among several factors explaining such higher levels of mortality among disadvantaged groups.[40,41] Emerging evidence suggests there may be lasting effects of COVID-19 on disadvantaged communities, including rises in unemployment and child poverty as well as temporary school closures.[42] Initial evidence on the economic effects of the pandemic in Wales appear significant,[43] with negative effects being particularly pronounced for the most deprived, women and those from minority ethnic backgrounds.[44] Given the UK's imminent departure from the European Union, with the potential risk of imposition of trade tariffs and barriers with the continent and the risk of such changes on public health,[45] such economic trends are cause for concern and may present adverse impacts for health equity in the years to come.

Any post-COVID recovery therefore must recognise the significant levels of inequality in Wales, the present climate of risks from the COVID-19 pandemic and from other challenges such as Brexit, confronting the need to address the determinants that are generating differential levels of mortality between socioeconomic groups, by selection of policies that will narrow the gap. Such policies have been articulated elsewhere before,[9] and include reductions in child poverty, early year investment particularly in areas of greater deprivation, reductions in inequalities in school attainment, policies to reduce in-work poverty and precarious employment while encouraging more people into work, improvements in social protection and investment in healthy and sustainable places.

In order to achieve this a national strategy with clear objectives is needed, underpinned by evidence of interventions that work and using surveillance tools such as that performed in this study to regularly monitor trends in inequalities and areas for action. We plan to undertake further analyses of the role of frontline services and national policies in addressing these challenges and, in turn, we see a unique window of opportunity post-COVID-19, given a promising policy context including A Healthier Wales[46] and Wales' Future Generations Act,[47] with the mandate it gives to public services to prioritise prevention, integration and sustainability, to rise to these challenges and begin addressing historic and rising levels of inequality in Wales.

Conclusions

Inequalities in life expectancy between areas in Wales increased in the years leading up to the arrival of the COVID-19 pandemic, driven particularly by decreasing life expectancy in the most deprived areas. This analysis identifies the underlying drivers and key conditions and age-groups that may warrant targeted action. While there appear to be clear opportunities for action through frontline services and via improved policies, there remains a clear need to act on the causes of the causes, or social determinants of health, and in particular to address, and learn the lessons from, the budgetary restrictions imposed since austerity in 2010. As health systems, social care and public services recover from the pandemic and plan resumption of services we advocate consideration of the significant inequalities that exist in Wales and a collective commitment to make progress in narrowing these, using this unique change moment to achieve positive and equitable action.

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Ethical approval: Not required.

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