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Explaining health inequalities in Australia: the contribution of income, wealth and employment

Joanne Flavel[A,B,*], Martin McKee[C], Fisaha Haile Tesfay[D], Connie Musolino[A,B], Toby Freeman[A], Helen van Eyk[A] and Fran Baum[A]

For full list of author affiliations and declarations see end of paper

***Correspondence to:**
Joanne Flavel
Stretton Health Equity, Stretton Institute, School of Social Sciences, Napier Building, North Terrace, Adelaide, SA 5005, Australia
Email: joanne.flavel@adelaide.edu.au

ABSTRACT

Background. Studies show widespread widening of socioeconomic and health inequalities. Comprehensive primary health care has a focus on equity and to enact this requires more data on drivers of the increase in inequities. Hence, we examined trends in the distribution of income, wealth, employment and health in Australia. **Methods.** We analysed data from the Public Health Information Development Unit and Australian Bureau of Statistics. Inequalities were assessed using rate ratios and the slope index of inequality. **Results.** We found that the social gradient in health, income, wealth and labour force participation has steepened in Australia, and inequalities widened between the quintile living in the most disadvantaged areas and the quintile living in the least disadvantaged areas. **Conclusion.** Widening income, wealth and employment inequalities have been accompanied by increasing health inequalities, and have reinforced and amplified adverse health effects, leading to increased mortality inequality. Effective comprehensive primary health care needs to be informed by an understanding of structural factors driving economic and health inequities.

Keywords: Australia, economic inequality, health equity, health inequalities, social class, social determinants of health, social gradient, socioeconomic factors.

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Introduction

Socioeconomic inequalities in health have widened in Australia (Adair and Lopez 2020). Brown *et al.* (2012) calculated the saving to the public purse if inequalities are reduced. The social determinants of health (SDH) are key drivers of health (CSDH 2008). This paper focuses on the role of employment, income and wealth, which influence people's health profoundly and need to be recognised in terms of grounding primary health care in the realities of people's lives (Baum *et al.* 2016).

There is a vast literature on the connection between employment status and health (Benach *et al.* 2007; Joyce *et al.* 2010; van der Noordt *et al.* 2014). For instance, people in lower socioeconomic groups are more exposed to adverse working conditions, including physically demanding work, shift work, and precarious and insecure employment (Benach *et al.* 2007). Likewise, inequalities in income and wealth have been associated with health inequities and gradients (Wilkinson and Pickett 2007).

The inequitable distribution of health is remediable with policies that address the SDH (CSDH 2008). Despite this, much research on improving population health has focused on the health system and/or targeted approaches that focus on individual behaviours rather than SDH (Balabanova *et al.* 2011; Katikireddi *et al.* 2013). This study contributes to a growing literature on health inequalities and SDH through examining measures of inequality that account for the social gradient by using all five quintiles and examining trends in SDH in addition to trends in three measures of mortality over three decades.

Methods

Study design

This study comprised descriptive quantitative analyses of Australian data from 1986 to 2017. This timeframe was chosen as availability of data was most comprehensive (some indicators were not available for the entire period). Data were collected that would enable descriptive analysis of the socioeconomic distribution of health, income, wealth and employment, and trends over time. This study goes beyond publicly available statistics reported by the Australian Bureau of Statistics (ABS), the Australian Institute of Health and Welfare and other published studies by examining all five quintiles in addition to differences between the most disadvantaged and least disadvantaged quintiles. Descriptive methods were chosen given that there are no individual data that include all the variables of interest (mortality and SDH), linked data for the variables and timeframe of interest were not available, limited comparability of many individual data sources over time, and the need for population data rather than cohort data to examine the full distribution of SDH.

Data sources and indicators

Data were sourced from the Public Health Information Development Unit Social Health Atlas (SHA) on age-standardised premature mortality (deaths for people aged 0–74 years), avoidable mortality (deaths for people aged 0–74 years from avoidable causes) and infant mortality rates by Index of Relative Socio-economic Disadvantage (IRSD) quintile. Wealth data were obtained from the ABS covering Gini coefficients of household net worth and Gini coefficients of equivalised net worth. Income indicators drawn from the SHA covered key government income support indicators: receipt of unemployment benefits, low income and sole parent families. ABS data on equivalised household income inequality, income growth, occupation and industry were used. Data on unemployment and labour force participation were obtained from the SHA. Statistics on the top 1% income share were sourced from the world inequality database. We analysed data for the three time points that were available for each indicator from the SHA, as these provided the only data available by quintile of socioeconomic area disadvantage.

Social Health Atlas and Index of Relative Socio-economic Disadvantage

The SHA reports data by Population Health Area (PHA) and by socioeconomic disadvantage of area. PHAs have an average population of 22 000. The SHA ranks PHAs based on the IRSD score and divides the ranked PHAs into five quintiles (PHIDU 2022). Statistical Areas Level 2 (gazetted suburbs or rural localities) are grouped into quintiles by IRSD score for indicators derived from census data, and IRSD scores for each census were used to produce quintiles for that census year, and for the 2 years before and 2 years after that census year. The IRSD is one of the ABS Socio-Economic Indexes for Areas that can be mapped onto areas. The IRSD is a weighted sum of income, housing, education and employment variables that capture access to material and social resources, and factors enabling participation in society (ABS 2018). The IRSD is a commonly used indicator of socioeconomic status, as individual multidimensional measures of socioeconomic status are not available in routinely collected data in Australia.

Analyses

Data were extracted into Excel and Stata version 14. There are no linked data between health indicators and SDH, therefore, assessment of trends in inequality was undertaken by analysing rate ratios and the slope index of inequality (SII) for the SHA indicators. The SII is a regression-based indicator that quantifies the absolute linear association between socioeconomic rank and the indicator of interest (Moreno-Betancur *et al.* 2015). It is informed by all five quintiles and accounts for the social gradient. Rate ratios were calculated by dividing the rate for the quintile of the population living in the areas with the most disadvantaged IRSD scores by the rate for the quintile living in the least disadvantaged areas. Data used to produce the SII and rate ratios were population data (not a sample), therefore, uncertainty estimates were not needed. The SIIs and rate ratios were compared with those representing no inequality (1 for rate ratios, 0 for SIIs) to determine the extent of socioeconomic inequality for each indicator and changes in this over time. All assessments of inequality considered the underlying rates per quintile in determining the reliability of trends.

Ethical approval

This study involved secondary analysis of publicly available data sources, therefore, ethical approval was not required.

Results

Table 1 presents the rate ratios and the SIIs for health, income and employment for all indicators derived from the Social Health Atlas. Higher absolute values of SIIs represent higher inequality. Rate ratios represent the ratio of rates for the most disadvantaged quintile relative to the least disadvantaged quintile.

Health

The SII showed an absolute rise for avoidable mortality from −17.15 in 1997–2000 to −20.40 in 2003–2007 to −21.36 in

Table 1. Rate ratios and slope index of inequality for indicators from the Social Health Atlas related to health, income and employment.

Indicator		Rate ratio			SII		
		Period 1	Period 2	Period 3	Period 1	Period 2	Period 3
Health	Premature mortality (ASR per 100 000)	1987–1991	2003–2007	2013–2017	1987–1991	2003–2007	2013–2017
		1.55	1.60	1.98	−39.05	−28.00	−38.57
	Avoidable mortality (ASR per 100 000)	1997–2000	2003–2007	2013–2017	1997–2000	2003–2007	2013–2017
		1.55	1.69	2.13	−17.15	−20.40	−21.36
	Infant deaths (average annual IMR)	2003–2007	2008–2012	2013–2017	2003–2007	2008–2012	2013–2017
		1.58	1.73	1.92	−0.51	−0.51	−0.49
Income	Female sole parent pensioners (%)	1996	2009	2017	1996	2009	2017
		2.63	3.60	6.13	−1.32	−1.45	−1.42
	Single parent families with children (%)	2001	2006	2016	2001	2006	2016
		1.79	2.15	2.89	−2.89	−1.51	−6.59
	People receiving an unemployment benefit (%)	1996	2009	2017	1996	2009	2017
		2.64	3.55	5.23	−1.55	−1.15	−1.96
	Low income, welfare-dependent families with children (%)	2006	2010	2017	2006	2010	2017
		3.29	3.54	5.49	−2.50	−2.53	−3.35
Employment	Unemployment (%)	1986	2009	2016	1986	2009	2016
		3.00	2.58	3.32	−2.33	−1.15	−1.73
	Labour force participation (%)	1986	2009	2016	1986	2009	2016
		0.87	0.83	0.80	1.96	3.1	3.56
	Female labour force participation (%)	2006	2011	2016	2006	2011	2016
		0.78	0.78	0.75	3.35	3.51	3.96
	Jobless families with children (%)	2001	2006	2016	2001	2006	2016
		3.29	3.60	5.03	−4.57	−4.22	−4.51

The years corresponding with available data points differed between the different indicators. The columns for Period 1, Period 2 and Period 3 have been included to reflect the years of data corresponding with each indicator.
ASR, age standardised rate; IMR, infant mortality rate.

2013–2017. The SII for premature mortality was lower in 2003–2007, but this was temporary and the SII in 2013–2017 was as high as that in 1987–1991, and it is notable that the SII for premature mortality was higher than that for avoidable mortality. The SII for infant mortality was unchanged over the three time points. Rate ratios steadily increased for premature mortality, avoidable mortality and infant deaths, and for each of these indicators, the rate for the quintile living in the most disadvantaged areas had risen to approximately double that of the least disadvantaged quintile in 2013–2017.

Fig. 1 illustrates the steepening of the social gradient in premature and avoidable mortality. This is most noticeable for avoidable mortality, where both the SII and rate ratio increased.

Income and wealth

Our analysis of the distribution of disposable household income by income quintile found that the mean weekly equivalised disposable household income for the highest income quintile was 4.8 times higher than the lowest income quintile in 1994–1995, and increased to a peak of 5.6 times the lowest income quintile in 2007–2008. There was stagnation in disposable income for all income quintiles from 2013–2014 to 2017–2018. The income share of the top 1% has grown from 5.4% in 1983 to 12.4% in 2017, and grew even during the period of income stagnation (Fig. 2). Wealth inequality increased in Australia between 2003–2004 and 2017–2018 according to all measures. The Gini coefficient of household net worth rose from 0.573 to 0.621 between 2003–2004 and 2017–2018 (Fig. 3). The Gini coefficient of equivalised household net worth rose by a similar magnitude.

The SII for low income, welfare-dependent families rose (in absolute terms) between 2006 and 2017, and the SII for female sole pensioners rose between 1996 and 2009, and had changed little in 2016 (Table 1). There was a higher SII for single parent families with children in 2016, despite the SII being lower in 2006 compared with 2001. Likewise, the SII for people receiving an unemployment benefit was higher in 2017 than in 1996, despite a lower SII in 2009.

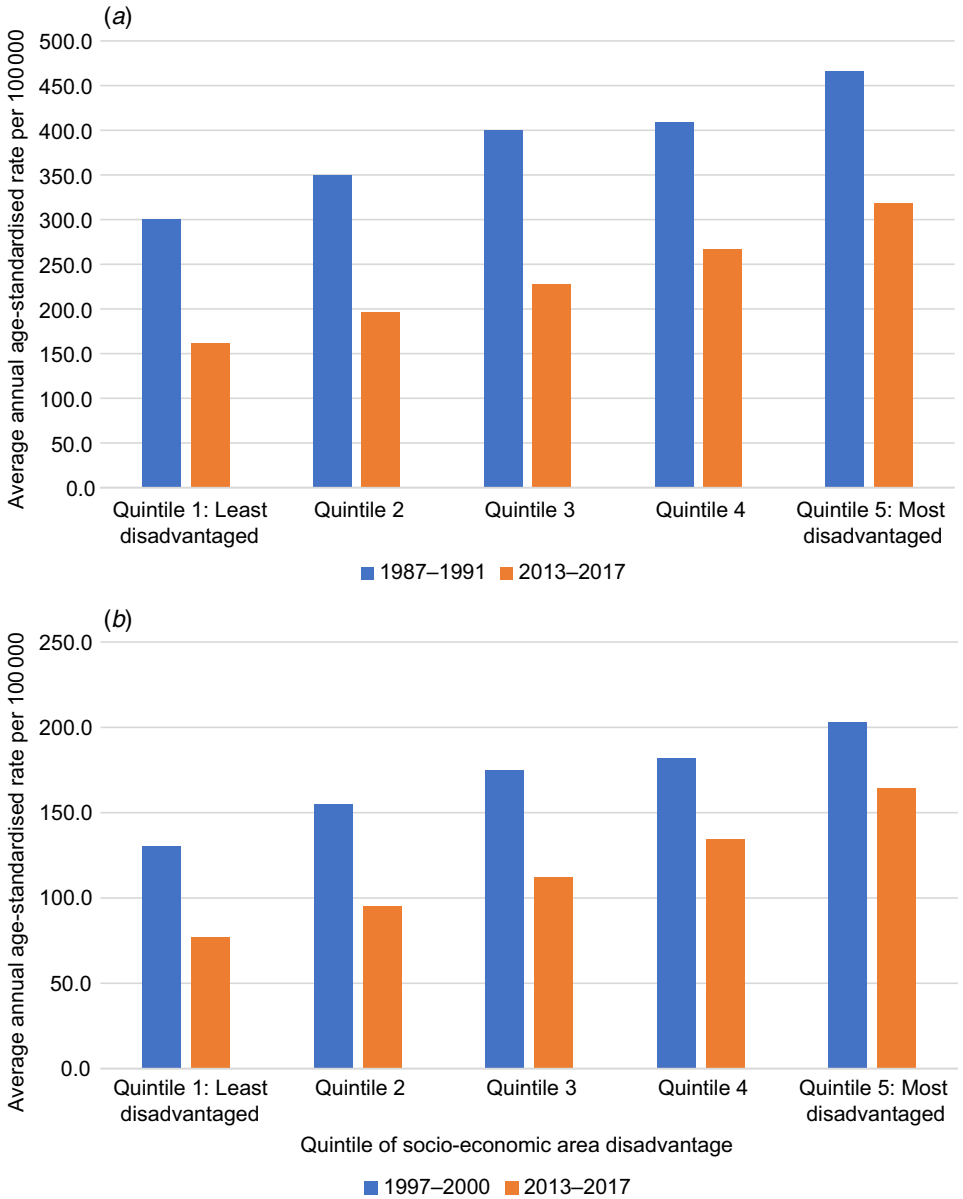

Fig. 1. (*a*) Age standardised rate of premature mortality per 100 000, ages 0–74 years, Australia, by quintile of socioeconomic disadvantage, 1987–1991 and 2013–2017. (*b*) Age standardised rate of avoidable mortality per 100 000, ages 0–74 years, Australia, by quintile of socioeconomic disadvantage, 1997–2000 and 2013–2017 (data source: Social Health Atlas, Public Health Information Development Unit, 2020).

There were large increases in the rate ratios for all four income-related indicators

Employment

The SII for labour force participation rose from 1.96 in 1986 to 3.1 in 2009 and 3.56 in 2016, and rose for female labour force participation between 2006 and 2016. Rate ratios for overall labour force participation and female labour force participation worsened, with the percentage participating in the labour force for the quintile living in the most disadvantaged areas being 0.8 times that of the least disadvantage quintile in 2016 (and only 0.75 for female labour force participation). The absolute SII for unemployment was lower in 2009 and 2016 compared with 1986, and the rate ratio for unemployment was also lower in 2009 before increasing in 2016. The SII for jobless families with children was little changed in 2016 compared with 2001, but the rate for the quintile in the most disadvantaged quintile rose to five times that of the least disadvantaged. There were greater gains in labour force participation for the less disadvantaged quintiles, but less inequality in changes in unemployment by quintile (Fig. 4).

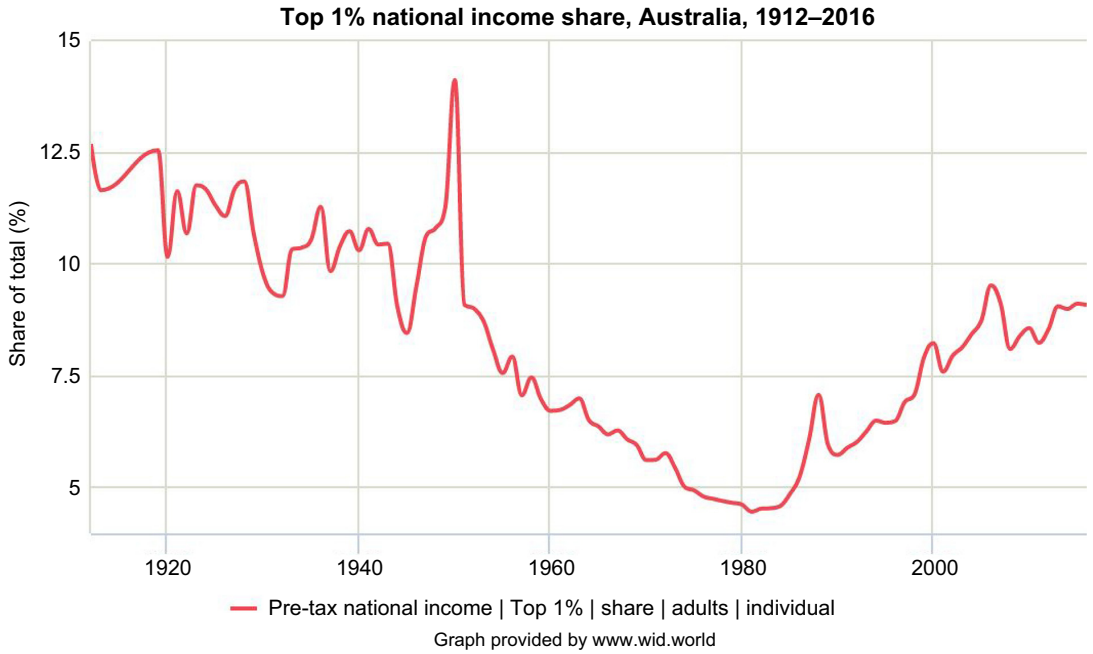

Fig. 2. Top 1% pre-tax national income share for individual adults, Australia, 1912–2016 (data source: World Inequality Database).

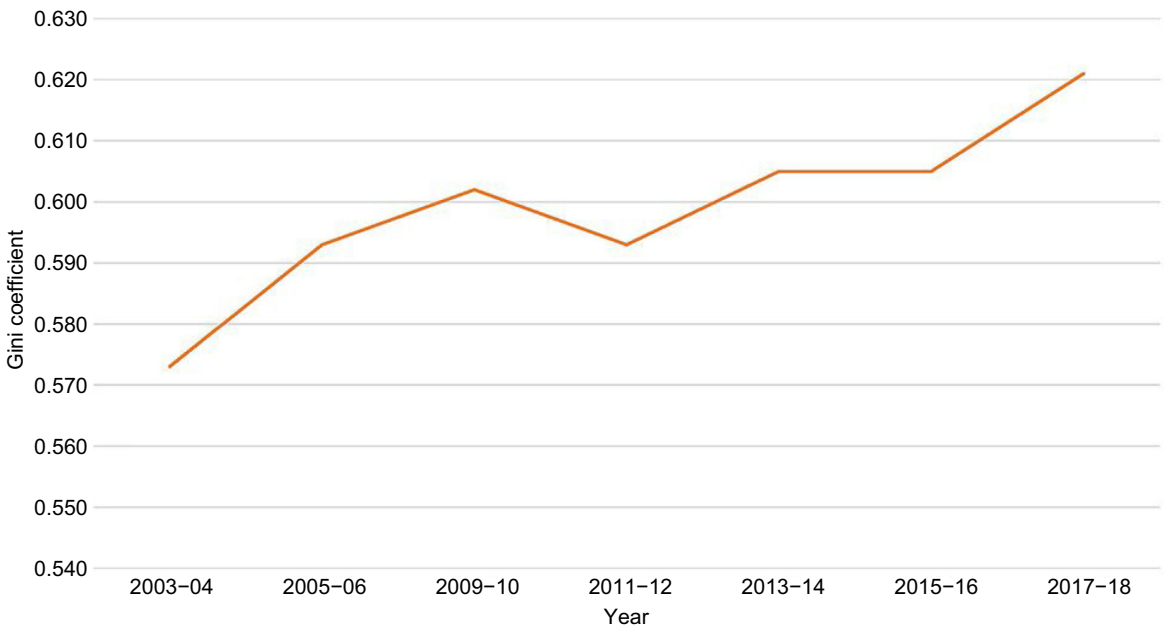

Fig. 3. Gini coefficient of household net worth, Australia, 2003–2004 to 2017–2018 (data source: Household Income and Wealth, Australia, 2017–2018, Australian Bureau of Statistics).

Low skilled jobs declined between 1996 and 2016 (Table 2). Health care and social assistance, construction, retail trade, accommodation and food services, professional, scientific and technical services, education and training, and public administration and safety saw increases in employment.

Discussion

Our analysis shows that inequalities widened between the most and least disadvantaged quintiles of area disadvantage for health, income and employment in recent decades. The analysis using all five quintiles found that the social

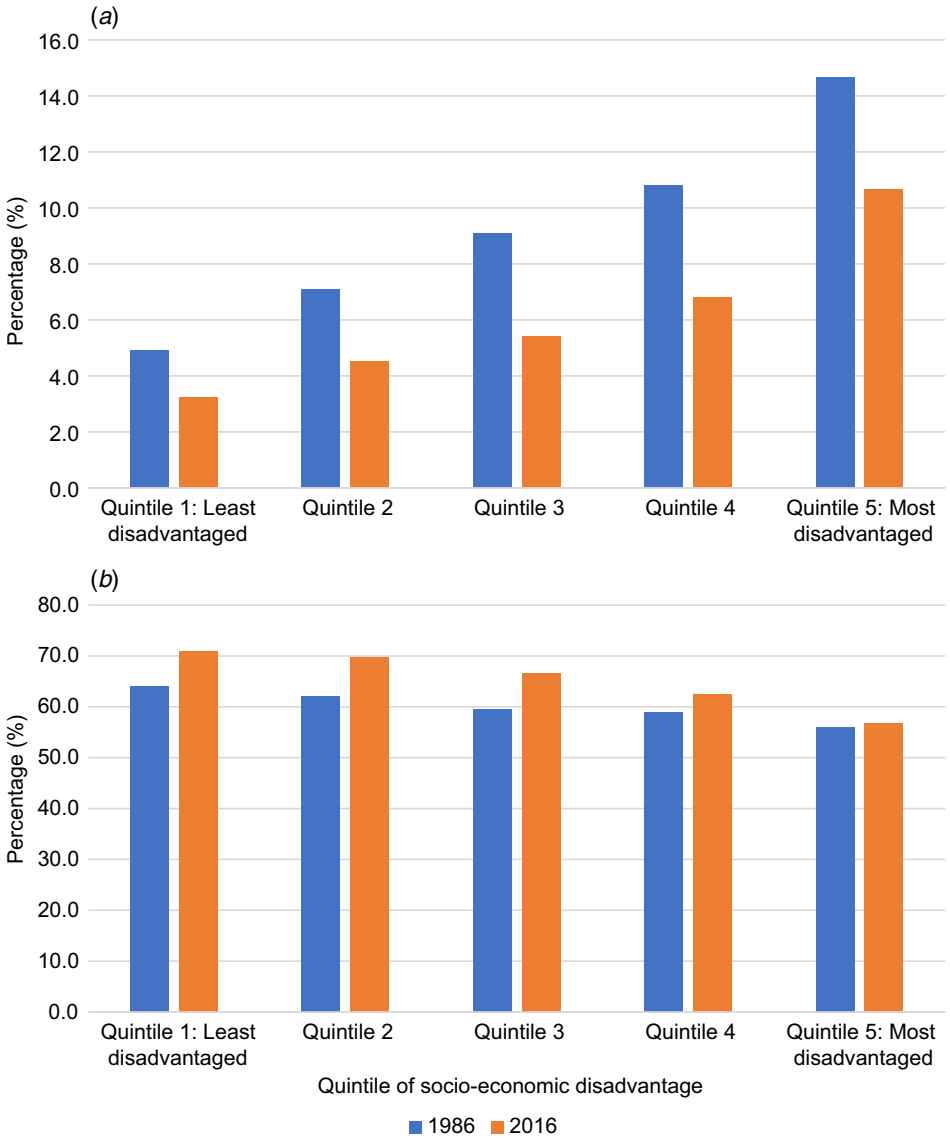

Fig. 4. (*a*) Unemployment by quintile of socioeconomic Disadvantage (%), 1986 and 2016, Australia. (*b*) Labour force participation by quintile of socioeconomic disadvantage (%), 1986 and 2016, Australia (data source: Social Health Atlas, Public Health Information Development Unit, 2020).

gradient in avoidable mortality, income, wealth and employment has steepened over this period. This steepening gradient has significance for comprehensive primary health care (CPHC), as the stresses caused an increase in related illnesses (Fisher and Baum 2010; Thoits 2010). Although we found overall improvements in health and employment, the gains were much greater for the 20% of the population living in the least disadvantaged areas.

The skill mix in the Australian labour market changed between 1996 and 2016, especially the decline of unskilled manufacturing jobs. Retail trade, accommodation and food services, health care, and social assistance showed an increase in employees, and these industries are more likely to offer casual and part-time employment, Although we could not examine associations between the SDHs and health directly, a large body of evidence points to how unequal distribution of income, wealth and employment are linked to increasing socioeconomic health inequalities (Marmot and Wilkinson 2005; Benach *et al.* 2007; Wilkinson and Pickett 2007; CSDH 2008; Barnay 2016). Our findings of increasing geographical inequality in labour force participation may be partially attributed to a mismatch between skills and available jobs in more disadvantaged areas due to the changed skill mix in the Australian labour market.

Increasing inequality in employment reinforces and exacerbates socioeconomic inequality in income and wealth. Those with higher incomes have higher levels of discretionary spending, whereas those on low incomes spend a much higher

Table 2. Employment by industry, Australia, 1996 and 2016 (data source: Census).

ANZSIC 1-Digit	1996	2016	% Change 1996–2016
Agriculture, forestry and fishing	324 330	266 946	−17.7
Mining	86 261	177 647	105.9
Manufacturing	922 899	683 688	−25.9
Electricity, gas, water and waste services	69 441	115 753	66.7
Construction	471 135	911 056	93.4
Wholesale trade	422 683	307 741	−27.2
Retail trade	778 005	1 053 816	35.5
Accommodation and food services	476 672	738 231	54.9
Transport, postal and warehousing	359 157	499 491	39.1
Information media and telecommunications	192 914	179 521	−6.9
Financial and insurance services	296 456	384 608	29.7
Rental, hiring and real estate services	118 554	182 151	53.6
Professional, scientific and technical services	467 170	775 978	66.1
Administrative and support services	211 736	365 731	72.7
Public administration and safety	466 527	713 135	52.9
Education and training	559 212	925 895	65.6
Health care and social assistance	716 163	1 351 015	88.6
Arts and recreation services	107 691	176 667	64.0
Other services	334 432	399 635	19.5
Total	7 636 319	10 683 848	39.9

proportion of their income on essentials (Beech *et al.* 2014). Inequalities in standard of living lead to health inequalities by affecting the quality of housing, food and health care people can afford.

Our findings provide detail on the increasing inequality in SDH, and the corresponding increase in health inequality, by examining the gap between the most and least disadvantaged. The growing gap results from lower socioeconomic groups living and working in difficult circumstances. These conditions mean they are more susceptible to poorer health outcomes through poor employment conditions, and lack of resources for social and economic participation (CSDH 2008).

CPHC professionals need to be aware of the impact of the structural inequalities on their patients and local communities, and provide comprehensive responses that take into account people's living circumstances. Primary health networks can use data on inequalities for intersectoral collaboration, and advocacy for policies likely to reduce economic inequalities.

Socioeconomic factors may be invisible to CPHC practitioners unless they are open to examining the changing socioeconomic dynamics in their patients' lives. Barriers to quality care can be reduced through policies, such as bulk billing patients, and practitioners asking people about their life circumstances (Browne-Yung *et al.* 2019). In addition, CPHC practitioners are powerful advocates for policy action on the SDH, especially when they understand the changing dynamics.

A government committed to reducing inequalities could reduce income inequality by increasing government income support to above the poverty line. Wealth inequality could be reduced by implementing more progressive taxation. Increasing the stock and quality of public housing would reduce rental stress and food insecurity. Fairer employment contracts and better working conditions would contribute towards reducing employment inequality. Finally, monitoring of health inequalities needs to be improved. In particular, small area data would be useful to CPHC services.

This study's strength is the use of multiple data sources, which draw on population data, and enable more detailed estimates of inequality in health and SDH over three decades, allowing examination of the changes in the social gradient for multiple indicators. IRSD rankings are used in Australia as a proxy for socioeconomic status, and here provide estimates of inequality for indicators where individual data are not available and over a longer time period than for most individual data (Mather *et al.* 2014). However, area-based data have been found to underestimate the extent of health inequality between individuals (Mather *et al.* 2014), and our estimates of health inequality should therefore be treated as conservative. Inferences also cannot be made about individuals based on aggregate, area-based population data (Mather *et al.* 2014), and reciprocal relationships cannot be examined.

Conclusions

This study provides new detail on population trends in inequality in health and SDH in Australia. Australia has become a less equal society in the past three decades, not just due to differences between the most disadvantaged and least disadvantaged, but due to a steepening of the social gradient that leaves all but the least disadvantaged worse off. CPHC can play a vital role in advocating for policies that reduce inequalities in income, wealth and employment, and being aware of the constraints people face, especially during health crises, such as the current COVID-19 pandemic.

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Data availability. Data used in this manuscript are publicly available, and can be found on the Public Health Information Development Unit website (https://phidu.torrens.edu.au/social-health-atlases/data) and the ABS website (https://www.abs.gov.au/statistics).

Conflicts of interest. The authors declare no conflicts of interest.

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Author affiliations

[A]Stretton Health Equity, Stretton Institute, University of Adelaide, Adelaide, SA 5005, Australia.

[B]College of Medicine and Public Health, Flinders University, Adelaide, SA 5042, Australia.

[C]Department of Health Services Research and Policy, London School of Hygiene and Tropical Medicine, London, UK.

[D]Deakin University, Institute for Health Transformation, Melbourne, Vic. 3125, Australia.