



The lowest fertility rates in the world? Evidence from the 2015 Chinese 1% sample census

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Abstract

As the world's largest population, the total fertility rate (TFR) of China is of global significance. Furthermore, the introduction of recent reforms designed to lessen restrictions on childbearing have received wide attention. As well as outlining the fertility rate in China as derived from the 2015 1% sample census, in this short paper we seek to explore the impact of the 2013 reforms to fertility policy which allowed millions of eligible couples to bear a second child. We performed standard demographic analysis on the 2015 1% sample census to calculate both TFR and parity-specific fertility rates for both the total population and specific sub-groups. The overall national TFR from the census was calculated to be 1.047 (down from 1.188 in 2010). TFR in urban areas was 0.914 compared to 1.265 in rural areas. TFR among migrant women was 0.896 compared to 1.115 for non-migrants. While a modest increase in second-births can be identified, a decline in first birth rates offsets it. Even allowing for a generous margin of error, China's fertility rates appear to be extremely low and declining further. The impact of the recent reforms appears muted, especially in the face of declining first birth rates. The TFRs as calculated from the mini-census would be the lowest national rates in the world. Further research is required to triangulate these findings from other sources. The impact of the two-child policy may be muted.

Keywords China · Fertility · Census · Marriage · Parity · Marriage age

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1 Introduction

Many studies have comprehensively appraised various aspects of China's recent demographic history and outlook (Basten and Jiang 2014, 2015; Cai 2012; among others). In short, China is grappling with a rapidly aging population, brought about in part by a transition to very low fertility coupled with negligible international migration and rapid improvements in longevity (Chen and Powell 2012). Clearly, the history—and future—of fertility in China is of central importance to this transition to an aged society (Guo 2012). However, the study of Chinese fertility is one beset with great controversy. In common with many countries, there is much debate on the primary *causes* of fertility decline in China. In particular, there is strong divergence among scholars on the relative role of birth control policies versus other factors such as economic and social development (e.g. Goodkind 2017; Wang et al. 2018).

However, in circumstances unusual for its stage of development, simply determining the actual fertility rates in China is also a perennial challenge (Basten et al. 2014). Given the difficulties in obtaining microdata regarding fertility, various studies, using various methods, have sought to determine the *actual* fertility rate in China and, unsurprisingly, coming to very different conclusions (e.g. Cai 2008; Zhao and Zhang 2010). For example, Lutz et al. (2007) reviewed 17 studies which sought to determine the national Total Fertility Rate (TFR) of China in 2000, and found no less than 32 different estimates ranging from 1.3 to 2.3.

The census has often been deployed as a means of determining fertility. Estimates derived from analysis of the census often appear to be at the lower end of the range of TFRs (Lutz et al. 2007). Of course, there has been tremendous debate concerning the validity of Chinese census data, not least regarding undercounts of children—and girls in particular (Goodkind 2004). On the other hand, other studies have suggested that under-counting in recent Chinese censuses may not, after all, be necessarily more severe in China than elsewhere (Zhang 2004; Zhao and Chen 2011). However, it has been suggested that in response to the *perceived* notion of undercounting, official statistics have been *inflated* (Zhao and Zhang 2010). Using the 2010 census data, Guo (2011) reconstructed fertility patterns for China from 1990 to 2010. These figures tracked closely the TFRs derived from the National Bureau of Statistics' *Annual Sample Surveys on Population Change*. Indeed, the latter reported very low TFRs of 1.39–1.44 in the early 1990s—well below the officially claimed figure of 1.8 (Zhang and Zhao 2006). Even the striking downturn to a TFR of around 1.3 observed for 2010 itself mirrored the trend observed in the NBS data (Guo and Gu 2014).

On November 1st 2015, a 1% sample census was conducted in China. This sample survey—often referred to as the 'mini-census'—was carried out by China's National Statistics Bureau midway between the 2000 and 2010 censuses in order to monitor the ongoing population situation. According to the General Office of the State Council, 'Data collected in the new sample census will help find out changes in the number, quality, structure, layout and housing conditions of the country's population since the country conducted its last national census in

2010' (Xinhua 2014). The 2015 mini-census is the fourth such round, covering around 60,000 residential quarters and around 14 million people (Xinhua 2014).

Performing this analysis for the 2015 mini census-data is especially interesting given the recent development in the national birth control system (Basten and Jiang 2014). It marked the official termination of the 35 year-long policy restricting some of the population to only having one child (Wang and Teng 2016). The announcement of a national 'Two-child Policy' in October 2015 represents less a paradigm shift from a 'National One-child Policy', but rather the continuation of a series of reforms dating back to 1984. In November 2013, for example, a major reform was announced which allowed couples where one was an only child to apply to bear a second child. This was, in turn, an extension of a long-held regulation allowing the majority of couples for whom both were only children to have a second child (Basten and Jiang 2015).

It is arguably too soon to perform a comprehensive evaluation of the impact of the transition to the Two-child Policy. Other studies, meanwhile, have sought to piece together evidence from a variety of sources to gauge the impact of the 2013 Reforms which could be a guide to future change. These have only been able to compare the *expectations* of the National and Local Health and Family Planning Commissions with fragmentary published local evidence from newspapers reporting the number of applications made by citizens wishing to bear a second child (Basten and Jiang 2014). Official sources suggest, however, that among the estimated more than 11 million couples who were eligible to have a second child under the new rule, only 1.69 million had applied as of August 2015, accounting for 15.4% of such couples.

While this again, is too soon to denote evidence of the potential impact of the Two-child Policy, it is possible to use the data to both calculate national level fertility rates as well as parity-specific fertility rates. By doing so, we are able to present not only the latest 'snapshot' of Chinese aggregate fertility situation, but also to identify the extent to which the 2013 Reforms may have had any impact on fertility above and beyond changes in the published number of births.

2 Aggregate measures of fertility in the 2015 1% mini census

Table 1 provides the parity-specific TFR for women of childbearing age between 1st November 2014 and 31st October 2015, as well as from earlier published censuses by way of comparison. The overall TFR for China in 2015, at 1.047, would represent

Table 1 TFR of women of childbearing age, women between 1st November 2014 and 31st October 2015 and various censuses. Sources: 2005 and 2015 mini census; 2010 6th census

Year	Parity specific TFR			Total (TFR)
	1	2	3+	
2015	0.556	0.416	0.075	1.047
2010	0.728	0.381	0.079	1.188
2005	0.891	0.384	0.063	1.338

the lowest recorded national TFR for the country as well as being one of the very lowest in the world (UNPD 2017).

Between 2010 and 2015, the census data seem to suggest that there has been a modest increase in the parity-specific TFR at the second birth; rising from 0.381 in 2010 to 0.416 in 2015. This figure would represent something of a ‘high water mark’ as compared to the past two decades. However, upon closer inspection, we can see that the primary driver of lowering fertility is, in fact, the decline in parity-specific fertility to the first child; falling from 0.891 in 2005 to 0.728 in 2010 to 0.556 in 2015. In this sense, any ‘gains’ which may have been made by an increase in second births have been offset by the decline in the number of first births. In other words, while it is too soon to gauge the extent to which childbearing is being eschewed in China, there is undeniable evidence of a pronounced postponement effect as regards at least period measures of TFR. This can be closely tied to the postponement of marriage (which we will return to shortly).

3 Disaggregated measures of fertility

For a country with a population of almost one-and-a-half billion comprised of 56 ethnic groups and a wide range of economic and social development, national level statistics only provide half of the picture. Fortunately, the census data allow us to explore in a little more depth some other aspects of fertility in contemporary China.

Table 2 shows the parity-specific TFRs for urban and rural areas. For our purposes, ‘urban’ is taken to be the sum of ‘City and Town’ statistics in the census, while ‘Rural’ is taken as ‘County’ statistics. The aggregate TFR is striking inasmuch as the decline in rural TFR has been very rapid over the past decade, perhaps indicating a tendency of convergence with urban fertility.

At the parity-specific level, the lack of any movement at parity two in rural areas is reflective of the fact that most couples there were already eligible to bear or have had a second child anyway. The modest increase in parity two fertility in urban areas again reflects that while this group were most affected by the reform, evidence from both China and elsewhere would suggest that it is urbanites who are *least* likely to want to bear a second child, at least as reflected in fertility intentions and other indicators such as the associated costs of childbearing (Hou 2015; Piotrowski and Tong

Table 2 Urban and rural parity-specific TFRs, women between 1st November 2014 and 31st October 2015 and various censuses. Sources: 2005 and 2015 mini census; 2010 6th census

Year	Typology	Parity specific TFR			Total (TFR)
		1	2	3+	
2015	City and Town	0.523	0.348	0.044	0.914
	County	0.607	0.530	0.129	1.265
2010	City and Town	0.686	0.257	0.037	0.979
	County	0.771	0.542	0.131	1.444
2005	City and Town	0.797	0.221	0.023	1.042
	County	0.990	0.560	0.104	1.654

2016). Again, however, any gains at parity two which may be derived from the policy relaxation are more than offset by declines at parity one. This is especially the case in rural areas, where the decrease in parity one fertility was the primary driver behind the fall to below 1.3. It is clearly notable that the TFR in rural China as derived from the 2015 mini-census—a part of the world often characterised by relatively low levels of development—is as low as can be found in many neighbouring industrialised (and post-industrialised) territories.

A significant mediating factor in comparing urban and rural fertility lies in the fact that some 250 million citizens are characterised as the ‘floating population’, or internal migrants working away from their home counties. These migrants are usually men and women of childbearing age and, as such, their own fertility behaviour can have a noticeable effect on aggregate figures. As well as the general challenges to childbearing and family formation that migrants around the world face, the Chinese *hukou* system of household registration means that opportunities for the children of migrants (and the parents) are often strictly curtailed in host cities. This leads to many parents leaving their children behind at home—there are estimated to be millions such ‘left-behind children’ (Ye 2011; Ye et al. 2013)—as well as to postponing or eschewing childbearing, as has been shown elsewhere (Morgan et al. 2009).

Table 3 compares the TFR of migrant women from the 2015 1% mini-census with data for non-migrant women. With an aggregate TFR of less than 0.9, migrant TFR is exceptionally low and lower than that of non-migrant women (1.115). Again, this is predominantly driven by a decline in first-order births from 0.838 in 2005 to 0.770 in 2010 to 0.522 in 2015.

4 The changing proportion of unmarried women of childbearing age and its impact to fertility rate in 2015

As we observed earlier, the changes in parity one births which are shaping overall trends in TFR are likely affected by developing trends in the age of marriage. Age at first marriage is noticeably lower in China than in its East Asian neighbours (UNPD 2017). However, in recent years the age at marriage has been increasing sharply (Wei et al. 2013; Yu and Xie 2015). The impact of this change in marriage

Table 3 TFRs for migrant and non-migrant women, between 1st November 2014 and 31st October 2015 and various censuses. Sources: 2005 and 2015 mini census; 2010 6th census

Year	Typology	Parity specific TFR			Total (TFR)
		1	2	3+	
2015	Migrant women	0.522	0.327	0.046	0.896
	Non-Migrant women	0.568	0.457	0.091	1.115
2010	Migrant women	0.770	0.316	0.058	1.143
	Non-Migrant women	0.718	0.400	0.089	1.206
2005	Migrant women	0.838	0.262	0.037	1.137
	Non-Migrant women	0.964	0.400	0.064	1.427

upon depressing period TFR through the operation of the tempo effect (especially in a country where birth outside of marriage is extremely rare) has been observed elsewhere (Gu and Cai 2011). As such, it is of crucial importance to consider the contribution of these changes in the marriage pattern to the TFR trends. This analysis is based on the results from the statistics of 2010 census and 2015 mini-census. The changes can be summarised as follows: apart from the 15–19 age group, the unmarried proportion of other age groups have increased. For example, the ratio in 20–24 age group increased from 67.5 to 74.4%, the ratio for 25–29 age group increased from 21.6 to 26.7%, up by 6.9 and 5.1%, respectively.

In order to calculate the exact degree of change of TFR that is derived from the increasing unmarried proportion during the 5 years, it is first necessary to break down the impact of proportion of unmarried women to fertility rate (Guo 2009) to calculate the exact degree of change of TFR that caused by the increasing unmarried proportion during these 5 years. The research in Guo (2009) was based on the problem of the high TFR caused by the problem of sampling of the 2006 Survey leaving out many young unmarried women. The calculation below presumes that if women of childbearing age in different groups keep the same unmarried level as in 2010, this is what the TFR should be in 2015. Therefore, as the numerator of fertility rate of different ages remains unchanged, the denominator is adjusted accordingly. We separate the real unmarried group from denominator based on the married ratio of 2015 (= 1 – unmarried ratio), and then use the high married ratio in 2010 to match the number of married women with relatively few unmarried women. Or, in other words, keeping the actual fertility rate of the married women in 2015 unchanged while adapting number of the unmarried in denominator according to the married ratio in 2010, to get an adjusted indicator of TFR for comparison. Simply put, that is to reduce the denominator of fertility rate accordingly, and see how the fertility rate may change.

According to Table 4, if the unmarried ratio of women of childbearing age in 2015 remains the same with the 2010 level (calculated by using the analysis sample),

Table 4 Calculation of influence on national TFR caused by the unmarried ratio of childbearing women

Age group	Married ratio (M)		2015 fertility rate		Adjusted fertility rate		Rate of change by hypothesis	
	2010 (%)	2015 (%)	${}_5f_x$	${}_5f_x^1$	${}_5f_x^*$	${}_5f_x^{1*}$	f_x change (%)	f_x^1 change (%)
15–19	2.1	2.4	0.009	0.008	0.008	0.007	87.0	87.0
20–24	32.5	25.6	0.055	0.040	0.070	0.051	126.7	126.7
25–29	78.4	73.3	0.074	0.042	0.080	0.044	107.0	107.0
30–34	94.7	93.0	0.045	0.015	0.046	0.015	101.9	101.9
35–39	98.2	97.9	0.019	0.005	0.019	0.005	100.4	100.4
40–44	99.2	99.0	0.005	0.002	0.005	0.002	100.2	100.2
45–49	99.6	99.5	0.003	0.001	0.003	0.001	100.0	100.0
Total	73.0	74.5	1.054	0.562	1.152	0.627	109.3	111.5

Formula for calculation: ${}_5f_x^* = {}_5f_x \times M_{2010}/M_{2015}$. This method also applies to the adjusted fertility rate of first child ${}_5f_x^{1*}$

the TFR published in 2015 would be adjusted from the real 1.054 to 1.152, increasing by 9.3%. Similarly, TFR of the first child in 2015 (0.562) can be increased by 11.5% to 0.627. Therefore, the very low TFR in 2015 is not only due to the fertility rate of married women and the delay of average fertility rate, the growth of the proportion of unmarried women is also an important factor.

The method of age-progressive fertility, proposed by Ma et al. (1986) and widely used in Chinese academic and state demographic analysis, strictly controls the risk groups of different parity, so that unmarried women are limited to affecting the progressive fertility rate of the first child and will not affect the progressive fertility rate of two or more children. However, the first group did not distinguish between unmarried and married groups, so it cannot control the impact of unmarried circumstances.

Based on the detailed analysis of fertility rate by category, TFR of migrant women at county-level is the highest (1.561) in the 2015 mini-census, but the unmarried ratio of this category is the lowest. The same method is applied to calculate the influence of TFR due to the increase level of unmarried ratio in the first 5 years. According to the calculation, for the category with high fertility rate, the change of unmarried ratio has greater impact on the fertility rate. After the unmarried ratio of this category is controlled in recent 5 years, the real TFR has been adjusted from 1.589 to 1.828, the gap of fertility rate is 0.239, an increase of 15%.

In summary, the increasing proportion of unmarried women of childbearing age is also an important factor of the low fertility rate. We also find the role it plays is related to the level of fertility itself, and the higher the fertility rate, the more obvious the effect is. During the statistical analysis of China's low fertility rate, this unique factor has often been neglected.

More importantly, the marital status of women of childbearing age in the 2015 mini-census is not sensitive to prevailing family planning regulations. Women of childbearing age generally do not need to conceal their actual marital status, and there is no existing literature that reflects the false information of marital status. Therefore, this variable most likely reflects the social reality among the population.

5 Discussion

According to the 2017 *World Population Prospects* (WPP) as published by the United Nations, the lowest total fertility rate in the world for the period 2010–2014 is in Taiwan, China (1.11); Macao SAR, China (1.19); Hong Kong SAR, China (1.20); Singapore (1.23) and Republic of Korea (1.23). Meanwhile, for the period 2015–2019 the lowest TFRs can be found in Taiwan, China (1.22). This is closely followed by Moldova, Portugal, Singapore and Poland, all of which are forecast to have TFRs below 1.3. For the period 2010–2014, meanwhile, Chinese TFR is reported in the WPP as being 1.60; and climbing to 1.63 in the 2015–2019 period.

Taken at face value, then, using evidence drawn from the 2015 mini-census, it could be argued that China has transitioned to having one of the very lowest fertility rates in the world—if not *the* lowest. This evidence is in keeping with previous studies which have identified very low fertility rates as derived from

census data (Guo and Gu 2014; Zhao and Chen 2011). While the 2013 reforms may have increased fertility rates in one way by boosting the number of second-borns, it might be possible to argue that other aspects of society, economy and policy serve to *depress* fertility in terms of first-born children not least as determined through an ongoing shift in the age of marriage. On an aggregate level, it appears that the short- to medium-term future of Chinese fertility may be characterised as something of a rollercoaster. In the near future, the impacts of the 2013 reforms will likely wear off, but then the impact of the National Two-child Policy may well serve to boost them again (although, as noted, the scale of this is quite questionable). However, despite these policy boosts, if first births continue to be eschewed/postponed, it may well be that aggregate TFRs stagnate or post only modest increases. When the boosts of these policy interventions run out, and if postponement is still a major feature, then TFRs may fall further. However, in common with most other low fertility countries undergoing the postponement transition, we may then see a rebound in period TFRs as a consequence of the tempo effect.

Disaggregating the data, we see that there is (a) something of a convergence of rural fertility towards urban TFRs and, (b) that the fertility of migrant women is lower than that of non-migrants. Under these circumstances, then, we might be confident in asserting that (a) China has transitioned to circumstances of very low fertility with period TFRs of around 1.0; (b) that the postponement effect is currently in full swing, with no immediate sign of where it will end; and (c) that structural changes in the economy (e.g. urbanisation, growing internal migration) may not be amenable to a rise in fertility under current conditions and therefore, *ceteris paribus*, China's population will continue to age rapidly.

This view, of course, is likely to be challenged. As we observed in the introduction, there is a long history of debate regarding the base data used for the calculation of Chinese fertility rates (see, for example, Cai 2008; Lutz et al. 2007). In particular, estimates of TFR based on the census have been held up for especial criticism, with the oft-repeated claim that high degrees of births have been withheld or otherwise misreported (for a review of this debate, see Guo 2012). Apart from the fact that the 'penalty' for misreporting births has been further neutered as a consequence of the 2013 and 2015 reforms, the consequence of this consistent claim about under-reporting in the census has, arguably, led to a policy cycle which could be deemed unproductive. Perceived misreporting in the previous censuses and the subsequent 'correction' or inflation of TFRs has been used as a justification for the maintenance of strict family planning restrictions.

As in the study by Guo and Gu (2014) concerning the 2010 census, we have presented the data from the 2015 mini-census 'without any statistical adjustment' (p. 27). Despite the fact that we are simply reporting the evidence we find in the census, we fully accept that many readers of this article will disregard our findings. This disbelief in the figures, may be embedded in a common 'belief' of what the TFR 'should be'. As Zhang and Zhao (2006) observed regarding the interpretation of the low fertility seen in the 2010 census, 'For their part, researchers have... been more willing to accept fertility estimates of a higher level than those of a lower level (p. 294).

Yet, before we write these figures off, we might consider the following evidence. Firstly, we have observed that the trends in TFR as calculated from this, and previous censuses, are broadly in line with a general trend towards very low fertility. Secondly, from a qualitative perspective, many of the social and economic developments in China point towards a decline in period TFR—albeit not pointing to a particular level as such (Basten et al. 2014). The impact of changing patterns of marriage, coupled with the contribution of very low fertility among the floating population could arguably serve to severely depress period TFR through the operationalisation of the tempo effect.

A final twist in the puzzle as to determining the ‘true’ fertility figure in China comes from the fact that the Government has itself published a national TFR of 1.05 as derived from the 2015 1% census. As an article in *Caixin* observes,

The China Statistical Yearbook 2016, published in October by the National Bureau of Statistics, said that China’s total fertility rate in 2015 was only 1.05. The Bureau said China’s average annual TFR from 2010 to 2014 was only 1.2, and the highest TFR in this period was only 1.28 (Wang and Teng 2016).

Indeed, the reporting of these figures in the media explicitly cited China as having ‘the lowest fertility rate in the world’ (Kaufman 2016; Murray 2016)—upon which we draw the title of this article. In July 2018, the state-controlled newspaper *Global Times* stated that ‘The fertility rate in China in 2015 was 1.05’ further citing that TFR in the north-eastern provinces was as low as 0.55 (Cao 2018). Indeed, it is widely accepted that at the provincial level huge swathes of the country are characterised by extremely low fertility. As *The Economist* reported in 2017 citing ‘National Statistics’, period TFR in Beijing, Shanghai, Tianjin, Liaoning, Jilin and Heilongjiang was below 1.0 (The Economist 2017). All of these figures are, of course, much lower than the figure of 1.6 reported by the then National Health and Family Planning Commission (Leng 2017).

In 2017, however, China’s National Bureau of Statistics ceased publication of the age-specific fertility rate of child-bearing women in the Statistical Yearbook (which had been reported since 2004) (Leng 2017)—thus removing a further means of calculating national TFR based upon official statistics. As demographer Liang Zhongtang remarked, ‘A gap between what the government actually got and what they had expected may persuade them to stop releasing the data’ (Leng 2017).

6 What of the future?

If the evidence is taken at face value, then we simply see Chinese fertility patterns behaving in much the same way as numerous other societies; namely a transition to very low fertility partly driven by the tempo effect in an environment which is considered to be non-conducive to higher levels of fertility (Frejka et al. 2010).

Of course, the extent to which the postponement effect alone drives down period measures of TFR and, by contrast how much recuperation might occur, will largely be shaped by external forces over the next decade or two. There are numerous policies in the pipeline to support couples in their childbearing aspirations; especially

relating to kindergarten provision and, potentially, some reforms of the tax code (Gietel-Basten 2016). There is also much potential in the ongoing reform of *hukou* system to support parents in the floating population. Similarly, local governments may well become even more proactive to support migrants both as workers and as parents. The extent to which these policies may in turn offset other fertility depressing factors such as cost of living and housing in particular, public/private gender roles, high opportunity costs for women, the fragile labour market—and many others besides which have been discussed at length elsewhere—is, of course, uncertain.

Finally, though, we might observe the risk of ‘missing the wood for the trees’. One of the key stated aims of the recent reforms was to tackle the ‘problem’ of population ageing. One might argue that raising fertility as a primary means of offsetting these ‘challenges’ is at best a blunt instrument; at worst a potentially counter-productive one raising, as it does, the *total* dependency ratio in the short term.

Rather, a closer examination of the ‘aging problem’ is that is a problem relating to extant health and pension systems; relating to productivity and an industrial model reliant on an endless supply of cheap labour; relating to a revolution in family roles which will necessarily mean a reorientation in who is responsible for who in old age. It is arguably by focussing attention on these ‘challenges’ rather than simply increasing the number of babies, that the best potential for tackling the ‘problem’ of aging might lie (Dorling and Gietel-Basten 2017).

7 Conclusion

In this paper, we produced a simple analysis of the 2015 mini-census of China without any statistical manipulation. Given the recent decision by the National Bureau of Statistics to cease publishing age-specific fertility rates, this data source represents one of the few means to calculate national and disaggregated measures of fertility in contemporary China. Our exercise found a national TFR of just above one, and very low TFRs in both urban and rural areas, and especially among migrant women. Our analysis of the contribution of changing trends in marriage lends credence to the idea that the postponement effect is being strongly felt in China.

We anticipate many readers will disregard these findings, simply stating that the figures are ‘too low’. We are not able to challenge preconceived notions of what the TFR in China ‘should be’; nor are we able to adequately interrogate the data in tandem with other sources to be able to properly identify the robustness of our findings. In publishing these data, however, we hope to spur others to explore the issue of this possible transition to very low fertility in contemporary China. Further work is needed in approaching fertility in the era of the Two-child policy in a multidisciplinary, multi-dimensional way; focussing on the role of changes in marriage patterns, preferences, work culture, family pressures—and all in a comparative context. Only by triangulating with (novel) quantitative and qualitative sources will we truly be able to gauge the extent to which these figures as shown in the 2015 mini-census are reliable.

When writing on the 2010 census, and the refusal of many to acknowledge the existence of such low fertility in the 1990s, Zhang and Zhao (2006) cited Ronald

Freeman's acknowledgement in 1986 that he had underestimated the pace and scale of fertility decline in Taiwan; making the admission to convince readers that 'social scientists, including demographers, have consistently underestimated the rate at which social change can occur' (Freedman 1986: 529). Zhang and Zhao concluded that the uncertainty around China's fertility levels at the turn of the 21st century may have arisen not only because of concerns over data, but 'may also have arisen from the fact that our thinking has fallen behind [China's] rapid demographic change' (p. 316). This 'general professional failing' resulted in an underestimation of fertility changes in China in the 1990s.

In publishing these figures, we recognise that we may well be chastised by many of our colleagues. However, we would rather this to be the case than be accused of such a 'general professional failing' to at least acknowledge the potential for the rapid social change we see in China to have such a profound effect on the fertility rate.

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