

Appendix 1. Explanation of sources for figures 1-14.

Fig. 1. For 1999: (Noto 2012) p. 27

For 2004: (World Health Organization. Regional Office for the Western Pacific 2005, 22)

For 2007: (Zhang 2015)

Note that this is a preliminary set of estimates that must be refined further pending collection and analysis of more comprehensive datasets.

Fig. 2. The data for transplant-related patents was obtained from the CNKI patent database available at <http://202.106.125.35/kns55/brief/result.aspx?dbPrefix=SCPD> (or elsewhere online; the official name in Chinese is 中国专利数据库). The search term used was 器官移植 [organ transplantation] in the 摘要 [abstract] field. The data displayed includes both an application and publication date, but given that they were identical for every year in the selection, the two were combined in the figure.

Fig. 3-7. The data for the first reported kidney, liver, lung, heart, and combined transplants was obtained by capturing the years in which a hospital — in the vast majority of cases on its own website — reported that it performed its first transplant of a certain type. In most cases, each hospital recorded only one ‘first’ in the transplant of a particular organ, though in a small number of cases it noted the first performance of different surgical methods of transplantation — for instance, the first orthotopic liver transplant in 2001, then the first piggyback liver transplant in 2002. In such cases, both were captured. The result is that there is an almost, but not quite, 1:1 relationship between the total number of new ‘firsts’ reported and the number of hospitals performing their first transplant of any particular organ type. In the ‘combined’ transplant category, each reported instance of a first particular combination of organs was counted; thus, a hospital that reported a first combined kidney and pancreas transplant was counted, as was the same hospital’s report of its first combined kidney and liver transplant.

Each datapoint for these graphs is found in Appendix 2, with the sources in Appendix 3. Where the original source identifies the time of first transplant as an entire decade — as in the case of the Changsha Military Region Hospital (cell A201, 长沙军区医院) for instance, where the source said that the hospital’s first kidney transplant was performed in “the 1980s” — we recorded this as the middle of the decade in question (the decade being 1980-1989, the middle being 1984.5).

In most cases we attempted to preserve the original source in a third party archive service. In some cases, no current URL is available, and screenshots have been preserved in local files.

Fig. 8-9. Data was captured in much the same way as for Fig. 3-7, primarily from hospital websites. Each instance of the reported establishment of a new transplant laboratory, ward, or building was captured separately in our data, but aggregated in the figures as they are substantively similar for the purpose of understanding broad industry growth trends. This also captures additions to, and expansions and upgrades of existing infrastructure, as when

Southwest Hospital of The Third Military Medical University (A349, 第三军医大学西南医院) established a liver transplant center in 1996, and then an eye bank (for corneal transplantation) in 1998; or when the Xijing Hospital (A387, 西京医院[中国人民解放军空军军医大学第一附属医院]) first established its transplant center in 2000, and then upgraded it to an organ transplant center for military use in 2005.

Fig. 10. This table is simply reproduced from (QYResearch Solid Organ Transplant Immunosuppressant Research Center 2016) which is a commercial product and cannot be published. However, we can share the document with individual researchers under certain conditions upon request.

Fig. 11. China's official data source for kidney transplants is the China Scientific Registry of Kidney Transplants (CSRKT), established in 2009 by the then-Ministry of Health, and housed at the 309 PLA Military Hospital in Beijing. This official registry, however, is closed to the public. The only other way of getting an official data series of national annual and cumulative kidney transplant figures is via manual collection using sources that are as authoritative as possible. To this end we have used medical textbooks and clinical handbooks promulgated via official Communist Party and government channels, figures that appear in authoritative media (official or semi-official, or commercial media reports that quote leading transplant officials or otherwise cite official sources), and data from medical papers produced by surgeons in leading political positions in the transplant system who cite internal information, including the CSRKT.

The specific sources for the data in Fig. 11 are reproduced in Table A below, along with the year and figure. Cumulative data is also presented in the same manner.

Fig. 12. Another means of creating a data series for an official count of annual kidney transplants is to interpolate both annual and cumulative data. This is what Fig. 12, drawing from Table A below, does, with a bias to using whichever number is the largest, with multiple missing years' of data simply averaged. This choice was made because of the tendency of Chinese official sources to underreport, retroactively modify transplant numbers downwards, and fail to update aggregate numbers despite numerous other independent indicators of growing transplant activity and capacity. We argue therefore that reported official numbers should be assumed to be *minimums* and are almost certainly significant understatements of actual volume. Therefore, by compiling an annual series using values interpolated from both annual and cumulative figures, we believe we are most likely to arrive at the least wrong version of official figures.

Readers will note that while the table of cumulative figures below extends to 2015 (with some gaps) only figures up to 2009 are used as the basis of Fig. 12 in the report. This is because the cumulative kidney transplant figures plummet from 101,000 to 50,391 in 2009 and 2010 respectively, highlighting once again the serious questions about data integrity and reliability. Fig. 13 contains the full cumulative series, intended to highlight the conflicting official data.

Fig. 13. This annual series was created by interpolating the cumulative and annual figures where both were available; where only cumulative data was available between two years, a simple average was made to interpolate the annual figures.

Fig. 14. This data is taken directly from the China Liver Transplant Registry Annual Report 2011; see (Jiang WS, Zhou ZY et. al 2011)

Table A. Source of annual and cumulative data on kidney transplants.

Year	Annual (raw data)	Source	Madrid 2010 data*	Cumulative (raw data)	Source	Annual interpolated
1989	1049	(Huang Z. 2009, 176)				1049
1990						
1991						
1992						
1993				11971	(Xiong 2006, 1); (Qiu 1995, 256)	
1994						2207.5
1995	2382	(Huang Z. 2009, 176)				2382
1996				18768	(Ye 1999, 16)	2382
1997			3000			4016
1998	3596	(Huang Z. 2009, 176)	3700			4016
1999	4323	(Huang Z. 2009, 176)	4500			4323
2000	5542	(Huang Z. 2009, 176)	5500	34832	(Tan, Huang, and Zhang 2007, 411)	5542
2001	5561	(Huang Z. 2009, 176)	5500	40393	(Huang Z. 2009, 176)	5561
2002			5700	45828	(Yuan and	5435

					Zhuang 2007, 185--)	
2003			5500	50000	(Jiang 2007, 8)	4172
2004	10972	(Wang Z. 2007, 459)	10000	61973	(Gao et al. 2007)	11973
2005	8000	(Guo 2006)	8500			8000
2006			8000			5609
2007	3991	(Qi, Meng, and Jin 2013)	7700			5609
2008	6273	(Qi, Meng, and Jin 2013)	6274	86800	(Xinhua News 2009) (F. Wang 2010)	6273
2009	6766	(Qi, Meng, and Jin 2013)	6458	101000	(Chen 2013, 4)	14200
2010	5562	(Qi, Meng, and Jin 2013)		50391**	Citing CSRKT (Shi 2011)	
2011	5314	(Qi, Meng, and Jin 2013)				
2012				60654**	Citing CSRKT (Qi, Meng, and Jin 2013)	
2013						
2014						
2015				86800**	(He 2016, 80) (Pan 2009)	

*Madrid 2010 data' refers to that presented by Huang Jiefu in Madrid, 2010, and made available to participants. See (J. Huang 2010).

**Potential reasons for the halving of cumulative kidney transplant volume are discussed below.

Discussion of the halving of official reports of cumulative kidney transplant volume in 2010

The two most ready (and non-mutually exclusive) potential explanations for this anomaly are that the figures are counting different things, and/or that there is a deliberate attempt to downplay transplant volume.

The first datapoint, of 101,000 cumulative kidney transplants as of 2009, comes from the authoritative textbook *Clinical Guidelines for Organ Transplantation* published by the medical and health branch of Science Press, the largest state publisher of scientific research in the PRC. Its chief editor is Chen Xiaoping, at the time the director of the Department of Surgery, Tongji Hospital Affiliated with Tongji Medical College, Huazhong University; the rest of the editorial board for the volume hold positions of similar seniority and calibre. The figure is attributed to the Organ Transplant Registry managed by the Chinese Society of Organ Transplantation, a branch of the Communist Party-controlled Chinese Medical Association.¹

The second datapoint, of 50,391 cumulative kidney transplants as of 2010, appears in a paper written by the senior military surgeon Shi Bingyi, citing the CSRKT. The 60,654 figure as of 2012 is also cited to the CSRKT, while the 86,800 figure from 2015 (the exact same figure as cited in multiple official sources as of 2008) is quoted in a peer reviewed journal, and traces, ultimately to the second edition of the *China Renal Transplant Manual* (中国肾移植手册), which was not immediately accessible.

The use of these numbers, in particular the recycling of the well-established figure of 86,800 in several official sources in both 2008 and 2015, once more highlights the unreliable, contradictory, and obfuscatory nature of official transplant figures.

The full data series is nevertheless revealing precisely for its apparent intent to obscure. The halving of cumulative kidney transplant figures from 2009 to 2010 is unlikely to have been a mere clerical error, but appears to be an attempt at manipulating the numbers downwards, because they are consistent with the figures in the years following — as though the official data had been 'reset' in 2010. The sequence of figures following 50,391 in 2010 are 60,654 in 2012 and 86,800 in 2015 — which comes to an annual average kidney transplant figure of about 5,000 for 2011, and 13,000 for 2013 and 2014. These latter numbers, while as unreliable as any official data, still exceed the typical claims by leading transplant surgeons of 10,000 transplants annually.

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¹ The full name of the registry in Chinese is 中华医学会器官移植学分会中国器官移植登记处. Chinese Communist Party leadership and management of the CMA is evident from its website, where the CMA describes itself as “the bridge and belt between the Party and government and medical technology workers.” (“关于学会 [About the Association]” 2018) Cf. also the extensive and colorful Party Construction Work section of its website (“党建工作 [Party Construction Work]” 2018)

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