

Dear Mr. Englund,

Thank you for your note. This is a complex area and we appreciate the response.

The Washington Post has made an erroneous assumption in the presentation and defense of these data. An assumption has been made for which 1) no evidence is presented, and 2) countervailing evidence exists. By doing so, the Post misled readers to believe that the Chinese government's claim of its transplant volume is justifiable.

The incorrect assumption is the assertion of a statistical relationship between China's global share of immunosuppressants and its global share of transplants. The Post has not established or even proposed any causal mechanism about *why* these two figures should hold such a relationship, especially given the many variables in play.

The 1:1 equation between drug sales and transplant volume made in the article is invalid

One example showing this, presented already, is Japan. All available evidence indicates that the vast majority of Japanese transplant tourists travel to China for their organs (a number of public sources are presented on this at the end of the email).

Thus, there is a contradiction in the Post's dismissal of Japan as a counterexample: on the one hand, the Post claims that Japan's rate of prescription immunosuppressant drugs does not mirror its transplant activity, because there are many Japanese who got their organs abroad (in China, as is well known). Yet at the same time, the Post dismisses transplant tourism as a factor affecting the volume of immunosuppressant drugs sold in China. It is inconsistent to hold both of these claims simultaneously.

Japan's immunosuppressant consumption is 38% higher than China's, yet its transplants are only 15-20% of China's. The cause of this is either significantly higher drug prices in Japan compared to China, or significant levels of transplant tourism (to China), or a combination of the two.

Either way, these observations undermine the Post's claimed 1:1 relationship between transplants and drug prices in China, used to support the Chinese government's official transplant figure.

(Note that it is incorrect to describe Japan as an outlier. Outliers can only be identified in the context of a full dataset; moreover, outliers are never simply ignored — there is a reason for any particular country being an outlier.)

We would be happy to share the IMS data we have referred to on the condition that the Post agrees not to share it with any third party, including IMS, in case they attempt to track down the source.

The Post's assumption of a 1:1 relationship between a country's global share of drugs and its global share of transplants is also shown to be erroneous when looking at the United States.

The IMS slide in our possession, ending June 2015, shows that the US makes up 35.5% of the global share of immunosuppressant revenues (\$1.8bn). However, according to the World Health Organization's Transplant Observatory (<http://www.transplant-observatory.org/>), US transplants are about 25% of the global total. If the inductive logic the Post claimed was true, the US would have performed at least 10,000 more transplants a year.

There is a key statistical insight here: given that the share of global drug sales in the US, Japan, (presumably) Saudi Arabia, and no doubt other countries, are significantly *greater* than their share of global transplants, there must be other countries whose share of global of drug sales are significantly *lower* than their share of transplants — since the global total of each percentage is 100%.

The bottom line is simply that one cannot draw *any* conclusion about a country's share of global transplants based on that country's share of global immunosuppressant sales. There is no established relationship between the two that holds for every country, and the global total of transplants is itself unknown (due to China's suppression of information).

China's drug prices are not the global average, as assumed in your letter

Your letter says that “there would have to be a massive differential between Chinese drug prices and the global average to affect our conclusions.” This makes explicit the assumption that was implicit in the Post's article: that Chinese drug prices are about the global average.

This claim can be tested because of the implications it would have if it were true.

The Post assumes that the drug price is the only variable in the calculation. Based on drug prices being the only variable, according to the Post's logic, the price of immunosuppressants in the U.S. would be about 1.4x the global average (derived from 35.5% share of global drug sales divided by 25% share of global transplants).

If China's immunosuppressant price was close to the global average (as the Post assumes), then we should find that the price of immunosuppressants in the U.S. is about 1.4 times that in China.

However, as we now show, the price of anti-rejection drugs in China is between 2.5 and 4 times less than that in the US.

The annual cost of immunosuppressants for a transplant patient in China was 36000-48000 RMB in 2008, according to a State Food and Drug Administration report "大趋势--中国医药市场调研报告集(2008版)" p. 680, or about \$5500 to \$7300. It is clear from the Chinese literature that immunosuppressant drug prices have been driven down significantly in China, and there are major Chinese pharmaceutical manufacturers that have large purchase in the sector. The director of the liver transplantation center at West China Hospital of Sichuan University in 2006 told [Health Times](#), an official publication, that the first year immunosuppressant costs were 30,000 yuan followed by 10,000 yuan annually thereafter. A [2010 report](#) by the securities company Northeast Securities, whose clients pay for the research, quotes the standard figure of immunosuppressant costs being 30,000-50,000 RMB per patient (p. 4). This range appears again in the 2011 medical paper: Gu JF, Wang W. 微生物来源的免疫抑制剂国内外生产研发状况及市场分析. Chinese Journal of New Drugs. 2011;20(2). It also appears regularly in reports by securities analysts, who provide advice about investing in domestic pharmaceutical companies due to their profitable, high-margin immunosuppressant businesses, and in media reports.

If we took the middle range of these figures, 42000 RMB, this would be an annual cost of \$6300.

This is far less than costs in the United States. According to "The economics of kidney transplantation versus hemodialysis" by Loubeau et. al (Progress in Transplantation, Vol 11, No. 4, December 2001) the cost of immunosuppressants in the first year after a kidney transplant in the US is \$15926 (80% of which, \$13272, is covered by medicare). This is from 16 years ago (CPI adjusted it would be about \$22000, while healthcare inflation is known to be higher). The [August 2017 Milliman Research Report](#) estimates costs of \$28600 for all drugs in the 180 days after kidney transplant. But that includes non-immunosuppressants. A more recent estimate (2015) is [here](#), where generic tacrolimus is \$1068 per month and MMF \$950. That's nearly \$2000 a month, or \$24000 in maintenance doses a year. If MMF was used with cyclosporine (less common) it would be \$950+\$493, or about \$1400 a month, or \$16800 annually. The first 180 days, which include steroids, would increase the costs.

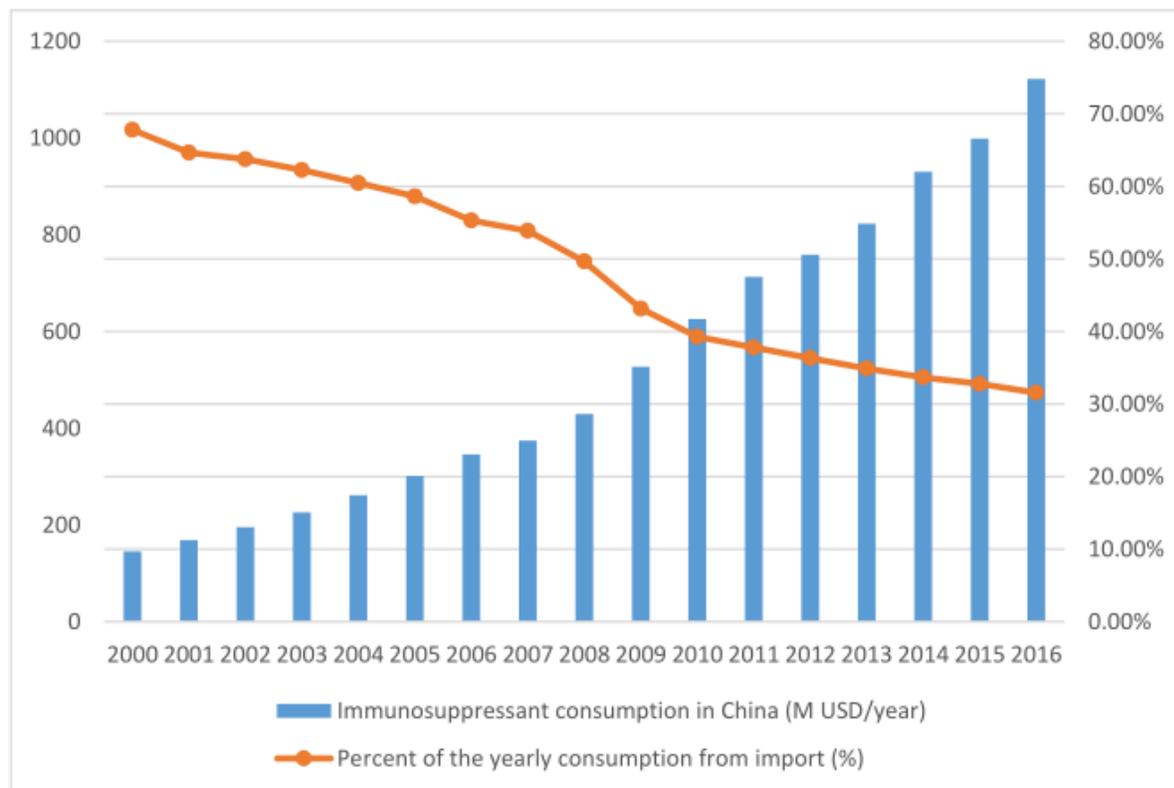
This shows that the annual immunosuppressant cost in the US is 2.5-4x that of China, not 1.4x, as the logic of the Post's response would predict. This shows that Post's assumptions, which were the basis of the disputed claim in the article, are erroneous.

Unofficial hospital pharmacies have not been considered by the Post

There is also a very important unknown that the Post acknowledges: unofficial hospital pharmacies. IMS does not account for, or provide an estimate of, the portion of drug sales that take place through these unofficial pharmacies (周边药店), which are widespread in Chinese hospitals. It is highly likely that, given the political sensitivities around organ transplantation, domestic immunosuppressants are primarily sold through these grey pharmacies, meaning that a large portion of them will not show up in IMS data. This does not undermine the utility of IMS data for foreign drug companies; they are still able to assess their market share compared to foreign competitors, and the fact that the dataset is incomplete does not make it useless.

QYR Research, a mainland Chinese provider of pharmaceutical market data, has this graph of the market share between domestic and foreign immunosuppressant drug manufacturers (Source: QYR Solid Organ Transplant Immunosuppressant Research Center. Global and China Solid Organ Transplant Immunosuppressant Consumption 2016 Market Research Report - Section. June 2016):

Figure Immunosuppressant Consumption in China (M USD/year) and Percent of the Yearly Consumption from Import (%) 2000-2016



Source: MENET, IMS, QYR Medicine Research Center, July 2016

There is a clear trend showing that domestic immunosuppressants are taking a greater share, reaching as high as 70% in 2016.

Sean O'Connor, Policy Analyst, Economics and Trade for the U.S.-China Economic and Security Review Commission [writes in February 2017 report](#) "Fentanyl: China's Deadly Export to the United States" that "the country's vast chemical and pharmaceutical industries are weakly regulated and poorly monitored. Chinese law enforcement officials have struggled to adequately regulate the thousands of chemical and pharmaceutical facilities operating legally and illegally in the country."

One would expect this to be particularly so for a politically sensitive product like immunosuppressants, used after organ transplantation, which has for decades been associated with the security forces and the military.

Conclusion

We have focused on the issue of immunosuppressant sales data because The Post presents this is a key piece of evidence in support of the Chinese government's claim of transplant volume. Yet there is a vast amount of evidence, coming from official Chinese sources, of organ transplant volume far in excess of what can be explained by judicial executions and voluntary donors. This evidence is verifiable and has been verified by independent researchers. The Post ignored this vast body of evidence and instead used IMS data, in a misleading fashion, to bolster the Chinese government's official argument.

To summarize:

*The claims made in The Washington Post implicitly assume a causal relationship between China's share of global immunosuppressant sales and China's global share of transplants (without making clear that the Post had in fact asserted this causality);

*The Post did not propose or test any mechanism for this assumed causal relationship;

*The data for one half of the relationship came from the Chinese government, is impossible to verify, and is heavily disputed;

*The 1:1 relationship does not hold true for Japan and the United States, which together compose 48% of the global total of immunosuppressant sales as of June 2015. It is, as the Post acknowledges, also likely untrue for some other countries. This further undermines the claim that it should hold true for China;

*A prediction contained in the assumption is that the price of immunosuppressants in the U.S. is about 1.4 times that in China. But upon investigation, it is found that U.S. prices are in fact 2.5-4 times those of China;

*The three major unknown factors — transplant tourism (for instance from Japan), cheaper drugs in China, and unofficial pharmacies — could easily combine to alter the estimate of China's official transplant figure by at least 100%. None of these factors are addressed by the Post.

The unsubstantiated claim made by the Post, based on a non-existent statistical methodology, has misled your readers to believe that the Chinese government's transplant numbers are justified.

We again insist that unless the Post actually finds evidence for what it claims, and deals with the countervailing evidence as above, the line in question be removed or altered and a correction issued noting the uncertainty around the matter.

Dated: October 12, 2017.

Sincerely,

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Addendum: Reports on Japanese transplant tourism to China

The evidence of significant efforts to recruit and cater specifically to Japanese transplant tourists by Chinese hospitals and surgeons is widely available. Below is a list of sources and indications of this practice. We are not aware of reports about any country specifically catering to Japanese transplant tourists, and there is no other country that provides livers and hearts (because no other country is known to kill the donors), rather than simply kidneys.

1.

A general picture of the business as it stood in 2006 was presented in the piece "Japanese Flock to China for Organ Transplants" (<http://www.atimes.com/atimes/China/HD04Ad01.html>) by Japan Focus.

2.

The website www.zoukiishoku.com (zoukiishoku means "organ transplant" in Japanese) operated from China until it was taken down in 2006. It had Japanese, Korean, Russian, and Chinese versions. Archives are here:

<http://web.archive.org/web/20050207114812/http://www.zoukiishoku.com:80/index.html>

<http://web.archive.org/web/20050207104914/http://www.zoukiishoku.com:80/cn/CHINA/INDEX.HTM>

The site was established in 2003, and calls itself the "China International Transplantation Network Assistance Center," based at the China Medical University First Affiliated Hospital. On its website it advertises that many of its staff have trained in Japan, understand Japanese culture, and that the majority of the nurses speak Japanese.

3.

The phenomenon of Japanese (among others) coming to China for transplant tourism has been covered extensively in publicly available Chinese media reports. A sampling:

<http://archive.is/js308#selection-599.2-586.9>

<http://www.51fenghuang.com/news/fengmiangushi/wgrfhqgyz.html>

http://news.bbc.co.uk/chinese/simp/hi/newsid_7890000/newsid_7893900/7893959.stm

(specifically about Japanese)

<http://news.qq.com/a/20090224/001625.htm> (specifically about Japanese)

<http://news.dwnews.com/global/news/2017-07-28/60003518.html> (specifically about Japanese)

<http://www.jnocnews.jp/news/show.aspx?id=33691>

<https://www.kannewyork.com/news/2016/09/17/40974.html> (this discusses Japanese transplant tourists getting organs with a wait time of merely 10 days)

4.

A BBC report from 2006 shows that the Tianjin First Central Hospital employs agents who speak fluent Japanese, another strong indication of catering specifically to Japanese transplant tourists. One would be hard pressed to identify any other country that offers Japanese language websites, as well as nurses and brokers fluent in Japanese, offering transplants on short notice.

https://www.youtube.com/watch?v=0wtSV_BEf14