



Health Action International (HAI) is an independent, global network working to increase access to essential medicines and improve their rational use through research excellence and evidence-based advocacy <http://www.haiweb.org>

Life-saving insulin largely unaffordable

– A one day snapshot of the price of insulin across 60 countries

Nearly ninety years after its discovery, access to insulin is beyond the reach of millions of people with diabetes around the world. Access to insulin is an essential and non-negotiable need, in short, a matter of life or death.

In many low- and middle-income countries, the availability of insulin in the public sector is often poorⁱ. Therefore, people with diabetes are either forced to purchase insulin in the private sector at its full price, use less than the prescribed amount so that their supply lasts longer, or go without. Serious complications result from suboptimal treatment, such as blindness and amputations, and pre-mature death.

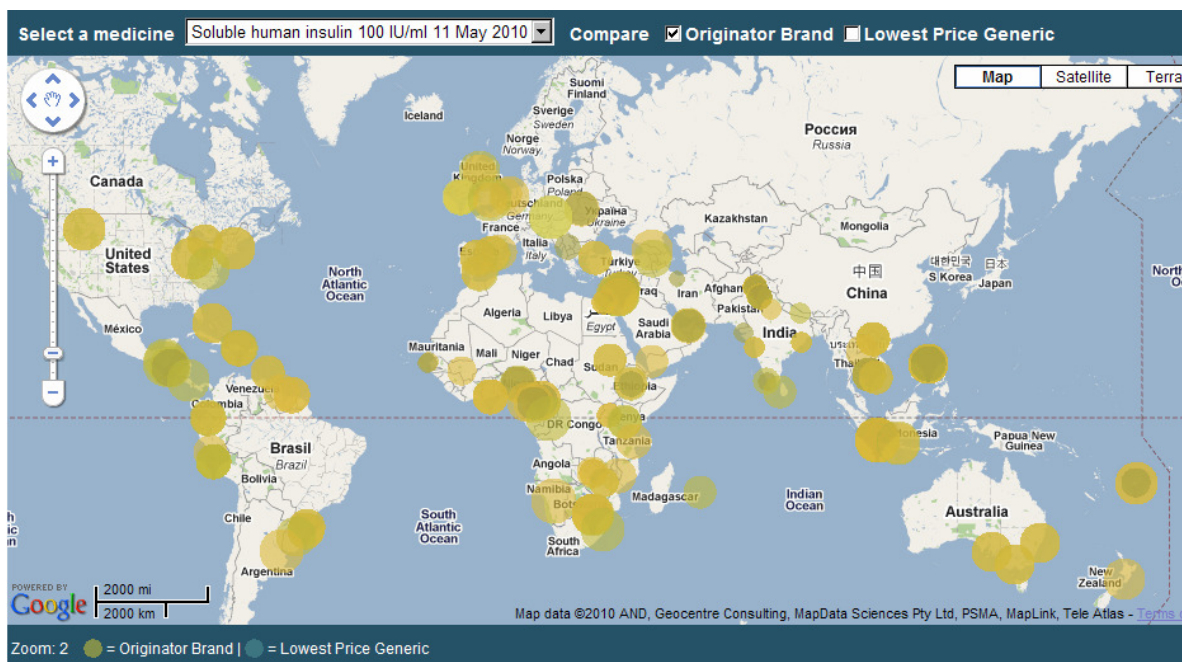
To illustrate the issue of high prices and unaffordable treatment, Health Action International (HAI) undertook a one day global 'snapshot' of the price of insulin.

Individuals from 60 countries collected the price which a patient would have to pay, if they paid the retail price (as opposed to a co-payment amount where reimbursement systems exist), for a 10ml traditional vial of 100 IU/ml soluble human insulin injectionⁱⁱ (regular, neutral) in their closest private retail pharmacy on 11 May 2010. Prices were collected for insulin manufactured by three multinational companies Novo Nordisk, Eli Lilly and Sanofi Aventis, plus the lowest priced insulin in the pharmacy produced by other manufacturesⁱⁱⁱ.

The map below shows the price for a 10ml vial of insulin converted to US\$ using the exchange rate of 11 May 2010 in each location where data was collected^{iv} - the larger the 'bubble', the higher the price. An interactive form of this map is on HAI's website (www.haiweb.org/medicineprices).

These prices should not be considered representative of the situation in a given country, since great price variation often exists within a country. However, they are indicative of what patients would have to pay, if paying the full retail price, in those pharmacies on that day.

The price a patient would pay for a 10ml vial of soluble human insulin in the private sector ranged from US\$1.55 in Iran to US\$76.69 in Austria - a difference of almost 5000%. Charts showing prices in all 60 countries are available on HAI's website.



Price variations across the world

As shown in the table below, there was little difference between the average price for a 10ml vial of soluble human insulin produced by Eli Lilly (about US\$24 a vial) and Novo Nordisk (about US\$21 a vial). However, insulin produced by other manufacturers was lower priced at about US\$13 a vial but found in fewer countries.

Price variations were seen across the world. Eli Lilly insulin varied from US\$2.57 in Egypt to US\$76.69 in Austria; Novo Nordisk from US\$2.97 in Senegal to US\$61.32 in the USA – with the prices in some low income countries being similar or greater than the prices in some high income countries.

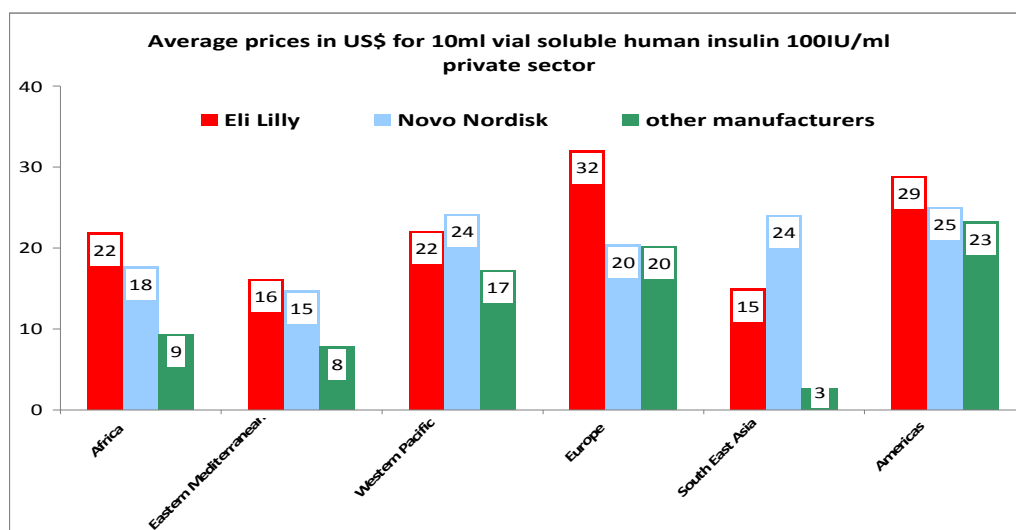
	<i>Eli Lilly</i>	<i>Novo Nordisk</i>	<i>Other manufacturers</i>
Average price US\$	\$24.04	\$20.58	\$13.11
Number of countries	40	48	16
Lowest average* prices found	Egypt	\$2.57	\$5.58
	India	\$4.99	\$3.48
	Iran		
	Nepal	\$3.70	
	Pakistan	\$5.87	\$5.54
	Senegal		\$2.97
Highest average* prices found	Argentina		\$42.78
	Austria	\$76.69	
	Congo	\$47.60	
	Costa Rica	\$51.21	
	Indonesia	\$39.50	\$44.68
	Palestine	\$42.67	\$30.14
	USA	\$53.05	\$61.32

* average where more than 1 price was reported for a country

Regional variations

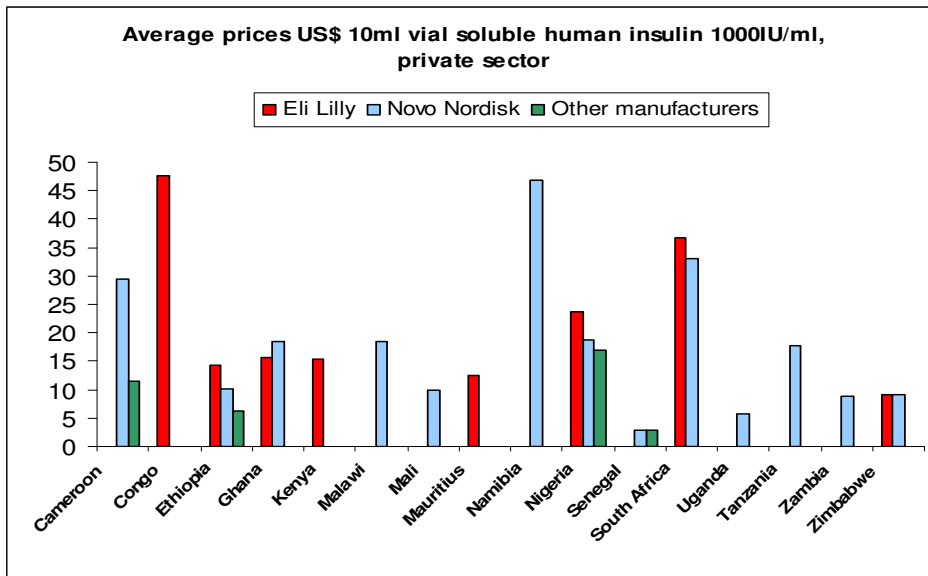
The chart below shows the average patient price within a WHO region and across regions^v.

- Average prices for insulin manufactured by Eli Lilly and Novo Nordisk were similar within that region except in Europe and South East Asia
- In Europe, the average price of Eli Lilly insulin was 60% more than Novo Nordisk insulin, whereas in South East Asia it was 40% lower priced
- In the Eastern Mediterranean, Africa and South East Asia insulin produced by other manufacturers was found at much lower priced than the Eli Lilly and Novo Nordisk insulin, however, other brands were not often found
- Across the WHO regions, the average price of Eli Lilly insulin doubled from US\$15 in South East Asia to US\$32 in Europe. The average price was almost 50% higher in Africa and the Western Pacific than in South East Asia and the Eastern Mediterranean
- Price variation across regions for Novo Nordisk insulin was slightly less; from an average of US\$15 in the Eastern Mediterranean region to \$25 in the Americas.
- The average price for insulin produced by other companies varied significantly across regions, from US\$3 in South East Asia to US\$23 in the Americas.



Prices vary greatly within a region

Insulin prices were variable between countries within a region – illustrated in the chart below with data from Africa. The price of Eli Lilly insulin varied from US\$9 in Zimbabwe to US\$47 in Congo. Novo Nordisk insulin varied in price from about US\$3 in Senegal to about US\$47 in Namibia.



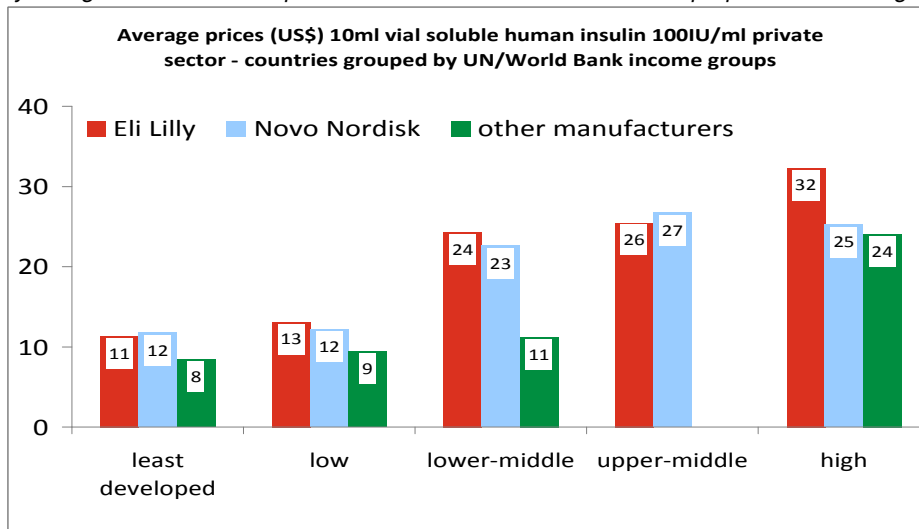
Insulin unaffordable for the poor

The chart below shows insulin prices in countries grouped by World Bank income level. In general, as the wealth of the country decreases the patient price of the insulin decreases.

Novo Nordisk offers human insulin to least developing countries (to the public and private sector) at no more than 20% of the average prices in Europe, Japan and North America. Nine of the 12 least developing countries where data was collected are thought to be purchasing Novo Nordisk insulin at these reduced prices^{vi}. From the prices in these 9 countries it would appear that either this offer of lower purchase price is not always being accessed or the low purchase prices are not always being passed on to patients.

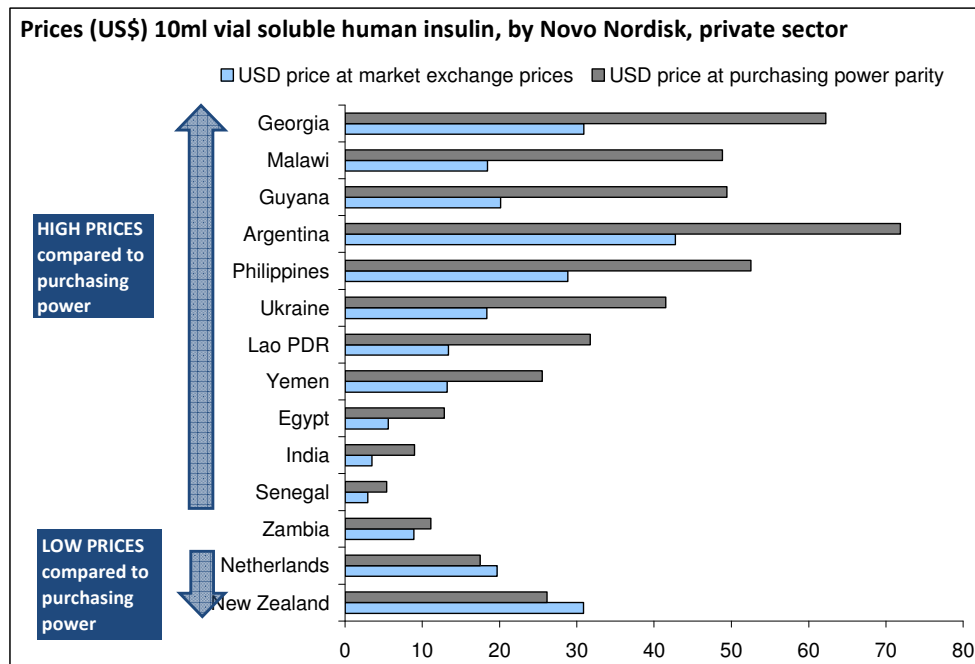
An analysis of insulin affordability at the family level shows an alarming picture. A family living on US\$1 a day in a least developed or low-income country would need to spend about one quarter to one half of their monthly income to buy 1 vial of insulin from a private pharmacy. Clearly, in this situation, insulin is unaffordable^{vii}. In a middle-income country, even on an income of US\$2 a day about one third to one half of a monthly income is needed to buy 1 vial of Novo Nordisk or Eli Lilly insulin. Addition costs such as syringes, needles and glucose monitoring tests push costs even higher, making access to continuous treatment beyond the reach of millions of people with diabetes. A Filipino comments on the stark reality of having diabetes:

"I cannot accept that I have diabetes. ... I have seven siblings and four of us have diabetes. My younger sister died a year ago because of complications of diabetes. Our assets and properties were all gone because of our sickness"^{viii}



Purchasing power: insulin can be considered as expensive in most countries

Since theoretically currencies should trade at the rate that would make the price of goods the same in each country, purchasing power is a good indicator of how expensive goods are. Where the price in terms of purchasing-power parity is greater than the price at market exchange rates, the goods can be considered as expensive in that country. Likewise where the price in terms of purchasing-power parity is less than the price at market exchange rates, the goods can be considered to be low priced. Looking at Novo Nordisk prices (chart below), the price for insulin in Georgia was extremely high at about US\$62 at purchasing-power parity (and a lower price at market exchange rates), whereas it was low in Senegal at about US\$5 (with a similar price at market rates). However even \$5 is too high a price for people on low incomes to pay.



Poor insulin availability

While this global snapshot did not assess the availability of insulin, a number of comments were received on this issue:

Nigeria - *Insulin is a strategic medicine which is shamefully unavailable. We have full states where there is no insulin available.*

Kyrgyzstan - *Irrational distribution is a problem. In some regions of the country there is more insulin than is needed, while at the same time in other regions there is a deficit.*

Studies have shown insulin availability is poor^{i,ix}. This is unacceptable for a medicine that is vital for life. Insulin must be available for patients who need it.

Conclusions

- There are a very limited number of manufacturers of insulin worldwide; the insulin market being dominated by Eli Lilly and Novo Nordisk
- The prices patients pay for the insulin of these two major suppliers are similar within countries, but prices vary across countries and regions of the world
- While patient prices are often lower in low-income countries, the prices in some low- and middle-income countries are higher than in high-income countries
- Even when prices are lower in some low- and middle-income countries, insulin is still unaffordable for those on low incomes which is often the majority of the population resulting in dire consequences for the diabetic if they cannot afford to buy
- The price of insulin could be much lower (and hence more affordable)

Recommendations

To improve treatment affordability, governments need to:

- Prioritise the health budget and provide financing to ensure that insulin is available free of charge to the patient in the public sector
- Ensure adequate forecasting, and efficient supply systems (including an adequate cold chain) to prevent stock-outs and maintain product quality
- Develop mechanisms for insulin to be provided in the private sector at little or no cost as occurs in some countries including Barbados
- Exploit differential procurement prices offered by some manufacturers - but also ensure that these lower purchase prices are passed onto patients
- Ensure syringes and needles are available and provided either free-of-charge or at affordable prices
- Ensure traditional vials of insulin remain on the market rather than only the newer much more expensive (and much less affordable) delivery devices such as pen injection devices and cartridges

This snapshot of the price of insulin is useful in illustrating prices across the world. However, it does not replace the need for governments to survey, and then continuously monitor, medicine prices, availability and affordability, in various sectors and regions within their country. WHO/HAI has a tool available to survey medicine prices and availability, and guidance on establishing monitoring systems (see www.haiweb.org/medicineprices)

Importantly governments need to act on the findings to develop policies and strategies to improve medicine affordability and availability, especially for medicines for chronic conditions such as insulin, monitor the outcomes and adapt to the continuously changing environment. To assist governments, WHO and HAI are currently developing in-depth reviews on various pricing policy options.

ⁱ Mendis S et al. The availability and affordability of selected essential medicines for chronic diseases in six low- and middle-income countries. *Bulletin of the World Health Organization*, 85(4):279-287.

ⁱⁱ Insulin delivered in pens and cartridges were excluded.

ⁱⁱⁱ Vials of soluble human insulin are marketed under various trade names including the following: Novo Nordisk Actrapid[®] Novolin[®]; Eli Lilly Humulin[®]; Sanofi Aventis Insuman Rapid[®]

^{iv} Exchange rates accessed on 11 May 2010 at <http://www.oanda.com/currency/converter/>

^v Number of countries in regional analysis: Africa – 8 Eli Lilly, 13 Novo Nordisk, 4 other; Eastern Mediterranean– 6 Eli Lilly, 7 Novo Nordisk, 4 other; Western Pacific – 4 Eli Lilly, 7 Novo Nordisk, 2 other; Europe– 7 Eli Lilly, 8 Novo Nordisk, 4 other; South East Asia– 4 Eli Lilly, 2 Novo Nordisk, 1 other; Americas – 11 Eli Lilly, 11 Novo Nordisk, 1 other.

^{vi} Senegal, Mali, Sudan, Zambia, Malawi, Uganda, Ethiopia, Yemen, Sudan. Novo Nordisk: Best Possible Pricing on Insulin (2007) www.novonordisk.com/sustainability/values_in_action/Access_to_health_subsites/Best_possible_pricing.asp

^{vii} Adult dosages often range between 0.3-1 IU/kg/day, which equates to 0.6 to 2 vials of 100IU/ml insulin a month for a 70kg adult

^{viii} Higuchi M. Costs, availability and affordability of diabetes care in the Philippines. http://www.fasid.or.jp/chosa/jyosei/list_pdf/19-1-e.pdf

^{ix} International Insulin Foundation. Report on the Rapid Assessment Protocol for Insulin Access in Mozambique, August 2004.

International Diabetes Federation. Report on the International Insulin and Diabetes Supplies Survey on cost and availability 2006.