



GOVERNMENT PROCUREMENT OF INSULIN

CASE STUDIES IN
11 LOW- AND MIDDLE-INCOME COUNTRIES

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GOVERNMENT PROCUREMENT OF INSULIN: CASE STUDIES IN 11 LOW- AND MIDDLE-INCOME COUNTRIES

Overview

This report from Health Action International's Addressing the Challenge and Constraints of Insulin Sources and Supply (ACCISS) Study provides insights into government procurement of insulin using ACCISS collected data covering a five-year period in 11 low-and middle-income countries: Burkina Faso, Mozambique, Uganda, Comoros, Djibouti, Kyrgyzstan, Lao PDR, Lebanon, Nepal, Pakistan (Punjab Province) and Sri Lanka.

This study was undertaken to better understand procurement practices and prices, and to assess the impact of Novo Nordisk's differential pricing scheme (entitled the Access to Insulin Commitment, A2IC).

This report includes price data, as well as insights into the procurement processes in the aforementioned countries.

From these results, key findings included:

- Governments procure in different ways, which impacts the prices paid.
- Biosimilars can offer savings for both human and analogue insulins. However, some low-and middle-income countries (LMICs) procure human insulin solely from Novo Nordisk.
- Governments and other national informants were largely unaware of Novo Nordisk's Access to Insulin Commitment (A2IC) for human insulin in vials. Novo Nordisk did not always submit tender bids in A2IC eligible countries and some countries paid far less, or far more, than the A2IC ceiling price.
- Sanofi's not-for-profit Insulin Glargine Impact brand offered significant savings compared to Lantus, but the price remained high.
- There is little transparency in selling and buying prices in the insulin market.

Background

Access to quality-assured affordable insulin is crucial to prevent serious complications and early death in people living with diabetes. Unfortunately for many, especially those in LMICs, this medicine is still out of reach. Since 2015, the ACCISS Study has been working to understand the barriers to insulin access. This research includes documenting the insulin and self-monitoring blood glucose diagnostic market, insulin donation programmes, estimating the cost of production, business models to improve insulin affordability, mark-ups and taxes in supply chains, developing government procurement guidelines and carrying out facility- and household-based surveys on availability and prices of insulin and supplies. Through this work, ACCISS developed a solid evidence base to demonstrate to governments, the private sector and other stakeholders that insulin prices are unaffordable, and that availability must be improved, particularly in the public sector.

The need to improve access to insulin was acknowledged in the 2021 World Health Assembly resolution on diabetes and reflected in the subsequent World Health Organization (WHO) target that ‘100% of people with type 1 diabetes have access to affordable insulin and blood glucose self-monitoring by 2030’. To achieve this target, governments must do more to contain insulin prices. They must also buy efficiently and, ideally, provide insulin free-of-charge to people in need, or at an affordable price for all their citizens living with diabetes.

To provide insights into government procurement of insulin procurements, in 2024, ACCISS collected data covering a five-year period in 11 LMICs. The aim of the study was to better understand the products procured, prices and trends, and to propose actions for lowering procurement prices.

Methodology

Data was collected on government tendering of insulin for the period 2019 to 2023. The objective was to assess what insulin types, brands and presentations were procured, the prices paid, and the awarded annual quantity.

The survey was conducted in the following countries:

- Low-income: Burkina Faso, Mozambique and Uganda
- Lower-middle income: Comoros, Djibouti, Kyrgyzstan, Lao PDR, Lebanon, Nepal, Pakistan (Punjab Province) and Sri Lanka

The countries were selected based on geographic spread, population size, whether procurement was conducted centrally and/or was decentralized, and where national investigators were available. Senior government officials involved in medicine procurement and tendering were interviewed based on a structured questionnaire. Data on insulins procured over the five years (2019-2023) were entered into spreadsheets developed for the survey (brand, presentation, awarded annual quantity, price paid and incoterm).¹ Prices in local currency were converted into US dollars.² Prices were for 10ml vials, and 3ml x 5 packs of prefilled pens or cartridges. Prices were not adjusted based on the incoterm.

¹ Incoterms are a set of 11 internationally recognized rules which define the responsibilities of sellers and buyers. Incoterms specify who is responsible for paying for and managing the shipment, insurance, documentation, customs clearance, and other logistical activities.

² Using Oanda and the exchange rate on the first day of the year except for Pakistan where official exchange rates were used.

Results

For the complete list of insulin brand names and their manufacturers listed in this report, please see Annex 1.

Burkina Faso

The Central Purchasing Office for Essential Generic Medicines and Medical Consumables (CAMEG) only procured insulin in 2020 and 2022. Tenders were awarded to Sothema for the supply of human insulin at less than US\$3 a vial (Table 1). In 2022 the volumes purchased were far lower than in 2020 (it was reported that large quantities of insulin had expired in previous years). However, a high-priced emergency purchase of Novo Nordisk's Actrapid was made.

Table 1. Annual government procurement of insulin, Burkina Faso

Year	Tender	Insulin type	Brand & presentation	Price USD	INCO*	Awarded quantity (vials)
2019	No	no procurement				
2020	Yes	regular human	Human insulin Rapid vial	\$2.65	CIP	2050
		NPH human	Human insulin Isophane vial	\$2.65	CIP	2410
2021	No	no procurement				
2022	Yes	regular human	Human insulin Rapid vial	\$2.89	CIP	300
		mixed human	Human insulin 30/70 vial	\$2.89	CIP	300
	Emergency purchase	regular human	Actrapid vial	\$6.19	CIP	1000
2023	No	no procurement				

*CIP (Carriage and Insurance Paid) -the price includes transport and insurance to an agreed place in the destination country

Mozambique

The government tendered for insulin each year (2019-2023). The only information provided was that Novo Nordisk did not bid in any of these years.

Uganda

Insulin is procured via restricted tenders to prequalified suppliers. In each tender, the local agent for Novo Nordisk (Star Pharmaceuticals) and Wockhardt (Gittoes Pharmaceuticals) submitted bids. It was reported that these bids include the local agent's mark-up. In three of the four years, Star was awarded the tender at prices of US\$4.63-4.68 a vial (Table 2). It was reported that the quantity procured was likely to be 2-5 times higher than listed in Table 2 (no further information was provided). Of note is the almost identical price of the biosimilar Wosulin N (Wockhardt) to the Novo Nordisk prices in previous years.

Table 2. Annual government procurement of insulin, Uganda

Year	Tender	Insulin type	Brand & presentation	Price USD	INCO*	Awarded quantity (vials)
2018/19	Yes	regular human	Actrapid vial	\$4.67	DDP	4081
		mixed human	Mixtard vial	\$4.67	DDP	16576
2019/20	Yes	NPH human	Insulatard vial	\$4.68	DDP	2868
2020/21	Yes	regular human	Actrapid vial	\$4.67	DDP	5148
		mixed human	Mixtard vial	\$4.63	DDP	35444
2021/22	Yes	NPH human	Wosulin N vial	\$4.63	DDP	2904

*DDP (Delivered Duty Paid)-the price includes all costs (transport, insurance, clearance, tax etc.) to an agreed place in the destination country

Comoros

The state agency Comorian Office of Pharmaceutical Products (OCOPHARMA) procures insulin via a WHO-mediated group purchasing agreement that includes seven small island nations in Africa. Procurement is from a selected wholesaler (there is no tendering). From 2019-23 (excluding 2022 when insulin was not procured), Wockhardt (Wosulin) and Biocon (Insugen) biosimilar human insulins were purchased at a cost of US\$5.14–7.17 a vial (Table 3).

Table 3. Annual government procurement of insulin, Comoros

Year	Tender	Insulin type	Brand & presentation	Price USD	INCO*	Awarded quantity (vials)
2019	No	regular human	Wosulin R vial	\$6.69	CIP	1600
		NPH human	Wosulin N vial	\$6.69	CIP	1600
2020	No	regular human	Insugen R vial	\$6.56	CIP	300
		NPH human	Insugen N vial	\$6.56	CIP	400
2021	No	regular human	Wosulin R & Insugen R vial	\$7.17	CIP	2120
		NPH human	Wosulin N & Insugen N vial	\$7.17	CIP	2930
2022	No	no procurement				
2023	No	regular human	Insugen R vial	\$5.14	CIP	720
		NPH human	Insugen N vial	\$5.14	CIP	720

* CIP (Carriage and Insurance Paid). Note: freight charges are exempted in the purchasing agreement.

Djibouti

Data was only obtainable from the Ministry of Health's Central Purchasing of Medicines and Essential Materials unit (CAMME). While CAMME purchases insulin, the bulk of the country's insulin needs are purchased by Caisse Nationale de Sécurité Sociale (CNSS).

Due to small volumes and unpredictable demand, CAMME buys insulin from local or overseas wholesalers, or local private pharmacies. No human insulin was procured in 2021 and 2022 as they had sufficient stock. Across the other years, a vial of human insulin ranged from US\$4 – 6.85 (Table 4).

A small quantity of Lantus prefilled pens was procured from a local pharmacy in 2020 and 2021 at a very high price of over US\$40 a pack. It was reported that private pharmacies sell Lantus pens to people living with diabetes for up to US\$90 a pack.

Table 4. Annual insulin procurements, CAMME (Ministry of Health), Djibouti

Year	Tender	Insulin type	Brand & presentation	Price USD (includes freight)	Awarded quantity**
2019	No	regular human	Actrapid vial	\$4.50	1000
		NPH human	Insulatard vial	\$4.00	990
		mixed human	Mixtard vial	\$4.57*	10000
2020	No	regular human	Actrapid vial	\$6.60*	3200
		mixed human	Mixtard vial	\$4.83*	37500
		glargine analogue	Lantus prefilled pens	\$41.20/pack	30 packs
2021	No	glargine analogue	Lantus prefilled pens	\$42.30/pack	60 packs
2022	No	no procurement			
2023	No	regular human	Actrapid vial	\$4.10*	1950
		mixed human	Mixtard vial	\$6.85*	10300

Pack size of prefilled pens was 3mlx5; *average weighted price; **Awarded quantity were vials unless stated.

Kyrgyzstan

Between 2019 and 2022, human and analogue insulin was procured by the Kyrgyzstan government through tenders. Novo Nordisk was the only bidder for human insulin as biosimilars were excluded. Their prices ranged from US\$3.07 – \$4.31 a vial, and US\$15.75-16.24 for a pack of 3mlx5 cartridges (Table 5). Analogues (prefilled pens and cartridges) were far higher priced at US\$39.37 to US\$81.93 per pack.

In 2023, KyrgyzPharmacia was established under the Ministry of Health to procure quality generics and originator brands at discounted prices. Insulin prices were negotiated and open to all manufacturers. In 2023, human insulin prices were less than US\$3 a vial, which was a drop of 15% from 2022. NovoRapid and Levemir (analogues) were also cheaper than the previous year (and Lantus was cheaper than the previous purchase in 2020). But the analogues were far higher priced than the equivalent volume of human insulin (albeit the quantity purchased was far less than human insulin).

In 2023, two brands of aspart cartridges were purchased, namely, NovoRapid (Novo Nordisk) and Trurapi (biosimilar made by Sanofi). Trurapi was 30% cheaper than NovoRapid (albeit twice the quantity was procured). Both brands of Sanofi's glargine insulin were also purchased, namely, Lantus and Insulin Glargine Impact. The Impact product was 38% cheaper than Lantus.

Table 5. Annual insulin procurements, Kyrgyzstan

Year	Tender	Insulin type	Brand & presentation	Price USD	INCO**	Awarded quantity***
2019	Yes	regular human	Actrapid vial	\$3.48	DDP	89500
		NPH human	Protophane vial	\$3.48	DDP	165750
		mixed human	Mixtard vial	\$3.48	DDP	5500
		aspart analogue	NovoRapid cartridges	\$40.08/pack	DDP	4200 packs
		determir analogue	Levemir cartridges	\$60.12/pack	DDP	2500 packs
		glargine analogue	Lantus prefilled pens	\$39.37/pack	DDP	1500 packs
2020	Yes	regular human	Actrapid vial	\$4.02*	DDP	90000
		NPH human	Protophane vial	\$4.04*	DDP	220000
		mixed human	Mixtard vial	\$3.88*	DDP	6000
		regular human	Actrapid cartridges	\$16.24/pack	DDP	1000 packs
		NPH human	Protophane cartridges	\$16.24/pack	DDP	2000 packs
		aspart analogue	NovoRapid cartridges	\$48.15/pack	DDP	7050 packs
		determir analogue	Levemir cartridges	\$81.93/pack	DDP	7050 packs
		mixed analogue	NovoMix cartridges	\$48.15/pack	DDP	1600 packs
		glargine analogue	Lantus prefilled pens	\$49.59/pack	DDP	1100 packs
2021	Yes	regular human	Actrapid vial	\$3.07	DDP	69830
		NPH human	Protophane vial	\$3.07	DDP	135000
		mixed human	Mixtard vial	\$3.07	DDP	5000

Year	Tender	Insulin type	Brand & presentation	Price USD	INCO**	Awarded quantity***
		aspart analogue	NovoRapid cartridges	\$40.30/pack	DDP	4000 packs
		determir analogue	Levemir cartridges	\$68.57/pack	DDP	2200 packs
		mixed analogue	NovoMix cartridges	\$40.30/pack	DDP	1250 packs
2022	Yes	regular human	Actrapid vial	\$3.34*	DDP	99830
		NPH human	Protophane vial	\$3.34*	DDP	195230
		mixed human	Mixtard vial	\$3.43	DDP	10000
		regular human	Actrapid cartridges	\$15.75/pack	DDP	1500 packs
		NPH human	Protophane cartridges	\$15.75/pack	DDP	2000 packs
		aspart analogue	NovoRapid cartridges	\$46.77/pack	DDP	6100 packs
		determir analogue	Levemir cartridges	\$47.12/pack	DDP	5000 packs
2023	Negotiated price	regular human	Actrapid vial	\$2.89*	DDP	150000
		NPH human	Protophane vial	\$2.94*	DDP	218000
		mixed human	Mixtard vial	\$2.93*	DDP	15010
		aspart analogue	NovoRapid cartridges	\$40.85/pack	DDP	4335 packs
		aspart analogue	Trurapi cartridges	\$28.28/pack	DDP	9600 packs
		glulisine analogue	Apidra cartridges	\$42.60/pack	DDP	5685 packs
		determir analogue	Levemir cartridges	\$40.73/pack	DDP	5500 packs
		glargine analogue	Insulin Glargine Impact prefilled pens	\$20.23/pack****	DDP	4690 packs
		glargine analogue	Lantus prefilled pens	\$32.91/pack	DDP	3500 packs
		mixed analogue	NovoMix cartridges	\$42.89*/pack	DDP	5005 packs

Pack size of cartridges was 3mlx5; *average weighted price; **DDP (Delivered Duty Paid)-the price includes all costs (transport, insurance, clearance, tax etc.) to an agreed place in the destination country; *** Awarded quantity were vials unless stated; ****The price of this product was determined by the Ministry of Health.

Lao PDR

The government tendered for insulin (for inpatient treatment only) from 2019–2021 (Table 6). From 2019–2021 it was reported that Novo Nordisk submitted bids (US\$4 a vial for human insulin) but the tender was awarded to other manufacturers whose prices were lower. In some cases, Novo Nordisk was unable to supply the required quantity. No further details were reported for these years. In 2022 and 2023, it was unclear whether insulin was purchased via a tender or another method. However, it was reported that Actrapid vials were procured at US\$5.65 each (quantity and incoterm were not reported) in both years. Also in both years Insulatard and Mixtard cartridges (3mlx5) were purchased at US\$26.67 a pack (2022) and US\$21.36 per pack (2023).

Table 6. Annual insulin procurements, Lao PDR

Year	Tender	Insulin type	Brand & presentation	Price USD	Awarded quantity
2019	Yes	unreported			
2020	Yes	unreported			
2021	Yes	unreported			
2022	Yes (?)	regular human	Actrapid vial	\$5.65	unreported
		NPH human	Insulatard cartridges	\$26.67/pack	
		mixed human	Mixtard cartridges	\$26.67/pack	
2023	?	regular human	Actrapid vial	\$5.65	
		NPH human	Insulatard cartridges	\$21.36/pack	
		mixed human	Mixtard cartridges	\$21.36/pack	

Pack size of cartridges were 3mlx5

Lebanon

The Ministry of Public Health (MoPH) procures insulin at the national level through an annual open tender, with the lowest priced bid winning the tender. In 2018, Julphar was awarded the tenders for regular, NPH and mixed human insulin (Jusline brand) at \$2.18 a vial (Table 7). Jusline was also purchased in 2019 and 2020 at \$2.18 a vial (based on the 2018 tender), but at substantially reduced quantities. It was reported that in 2018, Novo Nordisk submitted a bid of US\$6.21 a vial (CIF) for Actrapid, Insulatard and Mixtard. Bids were also submitted by Sanofi but at uncompetitive prices.

In 2020 Novo Nordisk donated vials of human insulin (Actrapid, Insulatard, Mixtard). This was likely in response to Lebanon's economic crisis that impacted the healthcare system and the massive ammonium nitrate explosion³ that year in Beirut. Over the following three years, Novo Nordisk and Eli Lilly donated human insulin in vials but transitioned to also supplying analogues in prefilled pens (Table 7).

Table 7. Annual insulin procurements, Lebanon

Year	Tender	Insulin type	Brand & presentation	Price USD	INCO*	Awarded quantity**
2018	Yes	regular human	Jusline R vial	\$2.18	FOB	18000
		NPH human	Jusline N vial	\$2.18	FOB	30000
		mixed human	Jusline 30/70 vial	\$2.18	FOB	42000
2019	No	regular human	Jusline R vial	\$2.18	FOB	6132
		NPH human	Jusline N vial	\$2.18	FOB	4774
		mixed human	Jusline 30/70 vial	\$2.18	FOB	26421
2020	No	regular human	Jusline R vial	\$2.18	FOB	6600
		NPH human	Jusline N vial	\$2.18	FOB	8212
		mixed human	Jusline 30/70 vial	\$2.18	FOB	12087
	Donation	regular human	Actrapid vials			unreported
		NPH human	Insulatard vials			unreported
		mixed human	Mixtard vials			unreported
2021	Donation	regular human	Actrapid vials			9500
		NPH human	Insulatard vials			9500
		mixed human	Mixtard vials			9500
		aspart analogue	NovoRapid prefilled pens			6640 packs

³ <https://pmc.ncbi.nlm.nih.gov/articles/PMC7985624/>

Year	Tender	Insulin type	Brand & presentation	Price USD	INCO*	Awarded quantity**
2022	Donation	regular human	Actrapid & Humulin R vials			Actrapid 98; Humulin unreported
		NPH human	Insulatard & Humulin N vials			Insulatard 124; Humulin N unreported
		lispro analogue	Humalog			unreported
2023	Donation	NPH human	Insulatard vials			500
		aspart analogue	NovoRapid prefilled pens			4000 packs
		detemir analogue	Levemir prefilled pens			4000 packs
		mixed analogue	NovoMix30 prefilled pens			3000 packs

Pack size of pens was 3mlx5; *FOB (Free on Board)-the price includes loading onto the boat at the port of shipment; **Awarded quantity were vials unless stated

Nepal

The Ministry of Health at the federal and provincial levels did not procure insulin from 2019-2023. Public sector hospitals (Ministry of Health and publicly-owned autonomous health institutions) buy human insulin from local authorized wholesalers on an ad-hoc basis. It was reported that insulin suppliers are not keen to submit quotations to the government for the supply of insulin as volumes are low and payments are slow.

Sri Lanka

The Sri Lankan government tenders centrally for human insulin in vials. Hospitals receive donations from Life for a Child⁴ and also buy analogues (pens and cartridges) from local suppliers/private pharmacies as needed on a named patient basis (under 25 years and living with type 1 diabetes).

In 2019, Julphar (Jusline brand) was awarded the tender for vials of regular (US\$2) and mixed (US\$1.15) human insulin. Novo Nordisk was awarded the tender for NPH insulin (Insulatard) at a higher price of US\$3.90 a vial (but for a smaller quantity).

In 2020, Wockhardt (Wosulin) won the tender for all three human insulins (all under US\$1.60) although Novo Nordisk's Mixtard was also purchased at a higher price of \$2.37 a vial. Wockhardt was also awarded the tender in 2021, with prices remaining at under \$1.60 a vial.

The following year (2022), Wockhardt was awarded the tender for the three types of human insulin and Novo Nordisk for regular (Actrapid) and NPH (Insulatard). Prices of the two manufacturers were similar, but Wockhardt's price was based on a far greater quantity. Of note were the supply issues. It was reported that the awarded quantities of Insulatard, Wosulin N and Wosulin 30/70 were only partially supplied.

In 2023, Sri Lanka experienced an economic crisis and Novo Nordisk continued to have supply issues. Human insulin was procured from three suppliers (Novo Nordisk, Indar and MJ Biopharma) at up to US\$3.52 a vial.

⁴Life for a Child <https://lifeforachild.org/>

Table 8. Annual insulin procurements, Sri Lanka

Year	Tender	Insulin type	Brand & presentation	Price USD	INCO*	Awarded quantity (vials)
2019	Yes	regular human	Jusline R vial	\$2.00	CFR	60000
		NPH human	Insulatard vial	\$3.90	CFR	12750
		mixed human	Jusline 30/70 vial	\$1.15	CFR	850000
2020	Yes	regular human	Wosulin R vial	\$1.55***	CFR	120000
		NPH human	Wosulin N vial	\$1.59	CFR	28000
		mixed human	Wosulin 30/70 vial	\$1.52***	CFR	1625000
			Mixtard vial	\$2.37	CFR	125000
2021	Yes	regular human	Wosulin R vial	\$1.55	CFR	90000
		NPH human	Wosulin N vial	\$1.57	CFR	30000
		mixed human	Wosulin 30/70 vial	\$1.50	CFR	2000000
2022	Yes	regular human	Wosulin R vial	\$1.60***	CFR	114000
			Actrapid vial	\$1.70	CFR	36000
		NPH human	Wosulin N vial	\$1.65	CFR	35000**
			Insulatard vial	\$1.70	CFR	15000**
		mixed human	Wosulin 30/70 vial	\$1.50	CFR	1500000**
2023	Yes	regular human	Actrapid vial	\$1.60	CFR	60000**
			Humodar R vial	\$3.52	CFR	30000
		NPH human	Insulatard vial	\$1.70	CFR	25000
			Humodar N vial	\$3.52	CFR	12500
		mixed human	Mixtard vial	\$1.55	CFR	900000**
			Biosulin 30/70 vial	\$1.62	CFR	450000

*CFR-Cost and Freight. The seller pays all costs to the port of destination; ** Part supplied; ***Average weighted price.

Pakistan, Punjab Province

In Punjab Province, DG Health Services and major hospitals tender annually for human insulin in vials. DG Health Services provide supplies to provincial primary and secondary care facilities, and in exceptional circumstances they supply tertiary care institutions. Large hospitals can also carry out their own tender purchases.

Tenders are restricted if three or more suppliers are pre-qualified (if less, open tenders are conducted). Since 2017, proof of similarity is required for biosimilar insulins. Generally, this has resulted in Novo Nordisk being the only eligible bidder. The policy of including a biosimilarity clause as a requirement of prequalification varies among hospitals. In this study, one of the hospitals purchased a biosimilar without requiring proof of biosimilarity.

Prices paid by DG Health tended to be lower than the four hospitals surveyed, which is likely the result of purchasing far larger quantities (Table 9). However, no human insulin price exceeded US\$2.52 a vial (which included all costs to the designated hospital pharmacies).

Table 9. Annual insulin procurements, Punjab Province in Pakistan

Year	Tenders		Insulin type	Brand & presentation	Price USD (to hospital pharmacy)	Awarded quantity (vials)
2018/ 2019	DG Health	Yes	regular human	Actrapid vial	\$1.28	unreported
			NPH human	Insulatard vial	\$1.28	unreported
			mixed human	Mixtard vial	\$1.28	260000
2019/ 2020	DG Health	Yes	regular human	Actrapid vial	\$2.25	unreported
			NPH human	Insulatard vial	\$2.25	unreported
			mixed human	Mixtard vial	\$2.25	1960000
	Hospitals	Yes	regular human	Actrapid vial	\$2.36-2.43	unreported
			NPH human	Insulatard vial	\$2.36-2.43	unreported
			mixed human	Mixtard vial	\$2.36-2.43	unreported
2020/ 2021	DG Health	Yes	regular human	Actrapid vial	\$2.45	unreported
			NPH human	Insulatard vial	\$2.45	unreported
			mixed human	Mixtard vial	\$2.45	1000000
	Hospitals	Yes	regular human	Actrapid vial	\$2.52	unreported
			NPH human	Insulatard vial	\$2.52	3450
			mixed human	Mixtard vial	\$2.48-2.52	unreported
2021/ 2022	DG Health	Yes	regular human	Actrapid vial	\$1.70	unreported
			NPH human	Insulatard vial	\$1.70	unreported
			mixed human	Mixtard vial	\$1.70	805500
	Hospitals	Yes	regular human	Actrapid vial	\$1.70-1.72	unreported
			NPH human	Insulatard vial	\$1.70-1.72	unreported
			mixed human	Mixtard vial	\$1.70-1.72	unreported
2022/ 2023	DG Health	Yes	regular human	Actrapid vial	\$1.97	unreported
			NPH human	Insulatard vial	\$1.97	unreported
			mixed human	Mixtard vial	\$1.97	800000
	Hospitals	Yes (1 hosp)	regular human	Actrapid vial	\$1.74	12000
			NPH human	Insulatard vial	\$1.74	8500
			mixed human	Mixtard vial	\$1.74	24300
		No (1 hosp)	mixed human	Insuget Mix vial	\$1.76	9600
			No (2 hosp)	Supplied from DG Health Services plus purchases from local retailers		
		2023/ 2024	DG Health	Yes	regular human	Actrapid vial
NPH human	Insulatard vial				\$2.38	93826
mixed human	Mixtard vial				\$2.38	1238103

Key Trends

Overview of procurement findings

- The procurement process is variable. Tenders may be awarded directly with manufacturers or with their local agents. Some governments forgo tendering and buy from overseas or local wholesalers, or from local private pharmacies. The process can significantly impact the price (see below).
- In some years, in some countries, no insulin was procured. This may be due to an oversupply from the previous year, insufficient budget or some other reason.
- The reported incoterms varied from Free On Board (FOB) to Delivery Duty Paid (DDP), therefore, some governments were paying additional costs for transport, clearance, taxes etc.

Overview of procurement prices

(1) Biosimilar human insulin

For human insulin in vials, three countries were buying only biosimilars and two purchased a mix of biosimilars and Novo Nordisk insulin (excluding emergency purchases).

Prices of one vial of biosimilar human insulin were US\$2.18 in Lebanon (Jusline brand) and US\$2.65–2.89 in Burkina Faso (made by Sothema). Prices were significantly higher in Comoros at US\$6.69–7.17 (Wosulin) and US\$5.14–7.17 (Insugen).

In Uganda, the only biosimilar purchased was Wosulin N at US\$4.63 (2021/22). This price was almost identical to the Novo Nordisk price, so there were no savings for the Ugandan government.

Sri Lanka was also buying from both Novo Nordisk and biosimilar manufacturers. In three of the six tenders where both a Novo Nordisk brand and a biosimilar were procured for the same insulin type, the biosimilar was cheaper by 3% to 36% (albeit in larger quantity). The other three cases were in 2023, the year Sri Lanka was in an economic crisis. While the Novo Nordisk brands were purchased in US dollars, the biosimilars were purchased in Sri Lankan Rupees at far higher prices.

This study showed that savings may or may not result when buying biosimilars. Factors that can impact prices include whether purchased via the tender or a top-up, the quantity purchased, and the volatility of the procurement currency. Four countries were only buying Novo Nordisk brands of human insulin. Influencing the purchase of biosimilar human insulin may be (1) no biosimilar manufacturer applying for marketing authorization in the country; (2) applying but not being granted marketing authorization; (3) no regulatory approval from a stringent regulatory authority; (4) no biosimilar having WHO prequalification.

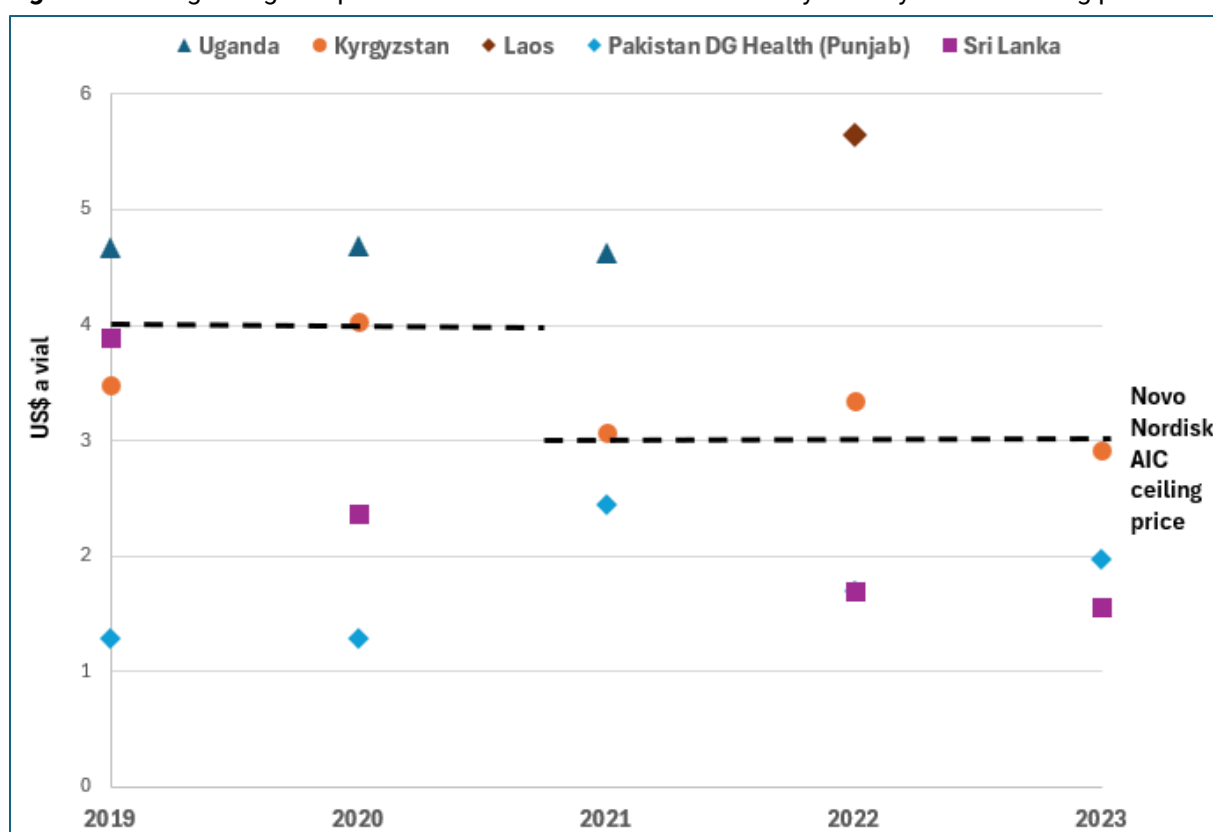
(2) Novo Nordisk human insulin

Of the countries who tendered, prices of Novo Nordisk human insulin ranged from US\$1.28 – 5.65 per vial. For a number of years, Novo Nordisk has operated a differential pricing scheme for insulin (entitled the Access to Insulin Commitment, A2IC). The A2IC is for human insulin in vials when sold to governments in Least Developed Countries (LDCs) as defined by the United Nations, other low-income countries as defined by the World Bank and middle-income countries where large low-income populations lack sufficient health coverage (as well as selected humanitarian organizations where the commitment is global).

Since 1 August 2020, the ceiling price is US\$3 a vial ex-factory in Denmark (in which case countries have to pay all other delivery costs, such as transport, insurance, clearance, duty). Prior to August 2020, the ceiling price was US\$4 a vial. Novo Nordisk does not publish actual selling prices.

All 11 survey countries are eligible to participate in the A2IC scheme. When asked if they were aware of the scheme, very few informants said they were. Figure 1 shows the average weighted tender price of Actrapid, Insulatard, Protophane and/or Mixtard vials by country. Uganda was paying approximately \$4.63 a vial from Novo Nordisk's local agent (2019 to 2021), which included costs to the medical store in the country. Little data was reported in Lao PDR but in 2022 they paid US\$5.65 a vial for Actrapid (the process was unclear but it was thought to be a tender). The prices paid by Pakistan's DG Health Services (Punjab), which included all costs to hospital pharmacies in the region, were significantly lower than the ceiling prices. These findings show that some countries are paying significantly less than the A2IC ceiling price while others are paying more.

Figure 1. Average weighted prices of Novo Nordisk human insulin by country vs A2IC ceiling price



(2) Analogue insulin

Only Djibouti and Kyrgyzstan procured analogue insulins, either in prefilled pens or cartridges. Prices were high. In 2020 and 2022, Kyrgyzstan purchased both human and analogue insulin in cartridges (all were Novo Nordisk products). For the identical pack size, the analogue cartridges were three times the price of the human insulin cartridges.

2023 was an interesting year in Kyrgyzstan with regards to analogue purchases. The first purchase of Sanofi's Global Health Unit's not-for-profit Insulin Glargine Impact was made, costing US\$20.23 per pack (cartridges). They also purchased Lantus cartridges in 2023, paying

63% more (\$32.91 per pack). Also in 2023, two brands of aspart were purchased - NovoRapid (originator, Novo Nordisk) and Trurapi (biosimilar, Sanofi). Trurapi provided savings as it was 31% cheaper than NovoRapid.

(3) Buying from wholesalers and private pharmacies

Rather than tendering, CAMME (Djibouti) was buying insulin from wholesalers (overseas and local) and local private pharmacies. There were examples of both similar and different prices, depending on the source. For example, in 2019, Actrapid from Germany and Turkey was US\$4.50 and US\$4 respectively, whereas Mixtard from India and Turkey was US\$5.14 and US\$4, respectively (a difference of 28%).

In 2023, equal quantities of Mixtard were procured for US\$4.50 a vial from a local wholesaler and US\$9.20 from a local pharmacy. Even between two local pharmacies there was an example of a 25% price difference for equal quantities of Mixtard.

(4) Price negotiation

Kyrgyzstan provides an example of the impact of price negotiation. In 2022, the government procured insulin by tender whereas, in 2023, Pharmacia negotiated the price. This resulted in lower prices e.g., the average weighted price for Protaphane fell almost 13% (from US\$3.34 to US\$2.93) for almost the same quantity purchased. Prices of Actrapid and Mixtard also fell by a similar percentage, although the quantities purchased in 2023 exceeded that of 2022.

Overview of supply issues

Supply issues were identified in some countries, which may be the result of inaccurately forecasting the quantity needed, manufacturers' unable to supply the agreed quantity or some other reason.

Emergency purchases are generally costly. For example, in 2022 Burkina Faso paid over twice the price for an emergency supply of Actrapid (US\$6.19) compared to the tender price for the Sothema brand (US\$2.72). In Sri Lanka in 2023, despite being awarded the tender for Actrapid and Mixtard Novo Nordisk only part supplied the agreed quantity. Biosimilars were purchased, but at higher prices.

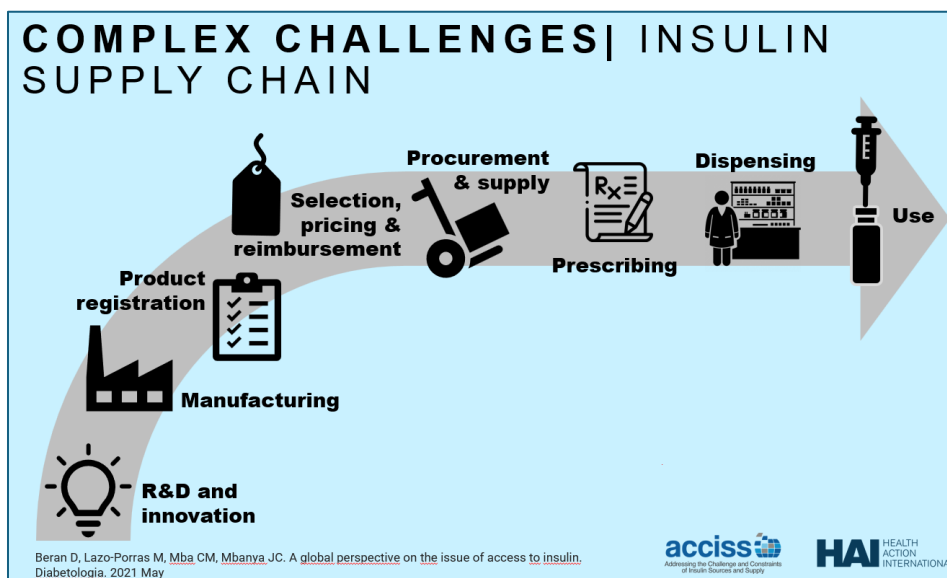
Limitations

- Despite requests, it was not possible to get complete datasets in some of the study countries.
- In this study, procurements in local currency were converted to US dollars to aid comparability. Where there is extreme devaluation of the local currency against the US dollar, trends in US dollar prices may not match trends in local currency prices. This was seen in Pakistan where prices in local currency increased over the study period, but the significant devaluation from 2021/2022 resulted in lower prices when converted to US dollars.
- The analysis of Novo Nordisk's A2IC scheme included all 11 survey countries due to their eligibility to participate. However, the findings cannot be considered representative of all 77 eligible LMICs.

Discussion and Conclusion

The ACCISS Study has identified multiple steps in the insulin supply chain impacting access to quality-assured and affordable insulin. They range from initial research, development and innovation to insulin use by people living with diabetes and include procurement and supply (Figure 2).

Figure 2. Key challenges in the supply chain impacting access to quality-assured and affordable insulin⁵



Effective and efficient procurement of insulin (and associated supplies) is important to both governments and individuals, especially in resource-constrained settings. Studies in the past have shown highly variable procurement prices for the identical insulin, and facility- and household-monitoring has shown poor availability that can result in rationing insulin use.^{6,7} This study was undertaken to better understand procurement practices and prices, plus assess the impact of Novo Nordisk's differential pricing scheme.

⁵ Adapted from: Beran D, Lazo-Porras M, Mba CM, Mbanya JC. A global perspective on the issue of access to insulin. Diabetologia. 2021 May;64(5):954-962. doi: 10.1007/s00125-020-05375-2. Epub 2021 Jan 23. PMID: 33483763; PMCID: PMC8012321.

⁶ https://haiweb.org/wp-content/uploads/2016/04/ACCISS-Prices-report_FINAL-1.pdf

⁷ <https://accisstoolkit.haiweb.org/monitoring-access-to-insulin/>

Key findings included:

- Governments procure in different ways, which impacts the prices paid.
- Biosimilars can offer savings for both human and analogue insulins. However, some LMICs procure human insulin solely from Novo Nordisk.
- Governments and other national informants were largely unaware of Novo Nordisk's Access to Insulin Commitment (A2IC) for human insulin in vials. Novo Nordisk did not always submit tender bids in A2IC eligible countries and some countries paid far less, or far more, than the A2IC ceiling price.
- Sanofi's not-for-profit Insulin Glargine Impact brand offered significant savings compared to Lantus, but the price remained high.
- There is little transparency in selling and buying prices in the insulin market.

Governments should review how they purchase insulin as there are various options, each with advantages and disadvantages. To aid procurement agencies, the ACCISS Study has published 'Guidelines for the Procurement of Insulins and Associated Supplies'⁸ These guidelines highlight important aspects to consider for ensuring a continuous supply of quality-assured insulin (and associated supplies such as delivery devices, blood glucose meters and strips etc.) at affordable prices. They could be used by procurement officers to review their procurement process, or to help guide the development and implementation of procurement strategies for insulin and supplies. The guidelines are based on WHO good practices and international references for procurement, as well as information available in the ACCISS toolkit. Two other tools are available to assist procurers:

- NCD Policy Lab 'Sources of insulin, oral medicines, and medical devices for diabetes for low- and middle-income countries'. This document lists initiatives at the global level which provide insulin and other diabetes products (UN agencies, company differential pricing schemes, donations, international distributors etc.)⁹;
- ACCISS Study list of insulin suppliers, and brand names, that have been found on the international market.¹⁰

Whether buying locally or internationally, by tender or other means, market surveillance is vital to help improve price efficiency, particularly when funding is constrained. Publishing procurement prices, quantities, incoterms etc. (as done by the Government of South Africa¹¹ and others), empowers all governments when buying insulin and associated supplies. The need for price transparency was agreed by Member States at the 2019 World Health Assembly.¹²

Information, market surveillance and transparency is also needed for industry differential pricing schemes, such as Novo Nordisk's A2IC and Sanofi's Impact range, to optimize use and assess if

⁸ https://accisstoolkit.haiweb.org/storage/2022/04/ACCISS-Procurement-Guidelines_Dec2021.pdf

⁹ <https://ncdpolicylab.org/resources/factsheets/sources-of-insulin-oral-medicines-and-medical-devices-for-diabetes-for-low-and-middle-income-countries>

¹⁰ <https://accisstoolkit.haiweb.org/storage/2024/11/Insulin-Products-Distributors-Oct24-002.pdf>

¹¹ <https://www.health.gov.za/tenders/>

¹² https://apps.who.int/gb/ebwha/pdf_files/wha72/a72_r8-en.pdf

they are meeting their objectives. While we applaud the provision of more affordable insulin in LMICs, no government in this study knew of the A2IC scheme. Novo Nordisk needs to address this. Clarity is also needed on the schemes themselves. For example, the definition of Novo Nordisk's access to insulin commitment to middle-income countries is unclear on their website.¹³ Neither Novo Nordisk nor Sanofi publish actual selling prices. It is challenging to know if a high price is due to the selling price and/or other charges (such as delivery costs, local agent mark-ups etc.).

It is vital that insulin users receive a continuous, uninterrupted supply. This study revealed examples where the awarded tender quantity was only partly supplied. This is unacceptable as emergency purchases of other brands tend to be at higher prices, plus switching brands requires additional glucose monitoring. Likewise, governments need to accurately forecast insulin needs and purchase sufficient insulin to meet requirements. Shortfalls will likely result in costly top-ups, and serious health consequences if people have to ration or forgo insulin treatment.

¹³ <https://www.novonordisk.com/sustainable-business/access-and-affordability.html>

ANNEX 1.

Insulin brand names and corresponding manufacturers

Brand Name	Manufacturer	Country	Insulin Type
Insugen R	Biocon	India	regular human
Insugen N	Biocon	India	NPH human
Insuget Mix	Getz	Pakistan	mixed human
Humodar N	Indar	Ukraine	NPH human
Humador R	Indar	Ukraine	regular human
Jusline R	Julphar	UAE	regular human
Jusline N	Julphar	UAE	NPH human
Jusline 30/70	Julphar	UAE	mixed human
Biosulin 30/70	MJ Biopharm	India	mixed human
Actrapid	Novo Nordisk	Denmark	regular human
Mixtard	Novo Nordisk	Denmark	mixed human
Insulatard	Novo Nordisk	Denmark	NPH human
Protophane	Novo Nordisk	Denmark	NPH human
NovoRapid	Novo Nordisk	Denmark	aspart analogue
Levemir	Novo Nordisk	Denmark	detemir analogue
NovoMix	Novo Nordisk	Denmark	mixed analogue
NovoMix 30	Novo Nordisk	Denmark	mixed analogue
Lantus	Sanofi	France	glargine analogue
Trurapi	Sanofi	France	aspart analogue
Apidra	Sanofi	France	glulisine analogue
Insulin Glargine Impact	Sanofi	France	glargine analogue
Human insulin Rapid	Sothema	Morocco	regular human
Human insulin Isophane	Sothema	Morocco	NPH human
Human Insulin 30/70	Sothema	Morocco	mixed human
Wosulin N	Wockhardt	India	NPH human
Wosulin R	Wockhardt	India	regular human
Wosulin 30/70	Wockhardt	India	mixed human