



## Application for inclusion of insulin analogue pens and pen needles into Kenyan Social Health Authority benefits package

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## 1. Executive Summary

Kenya's commitment to Universal Health Coverage (UHC) includes strengthening equitable access to comprehensive non-communicable disease (NCD) services. Priority UHC interventions for NCDs should cover measures to increase the proportion of the population able to access care, expand the range of services and commodities available within health benefit packages, and reduce the financial burden associated with long-term care.<sup>1</sup> In the context of diabetes, achieving these objectives requires that health facilities are equipped with a complete and integrated package of care, including appropriate diagnostics, medicines, monitoring tools, delivery devices and trained healthcare workers.

The inclusion of insulin pens and pen needles within the Social Health Authority (SHA) benefits package would support these UHC objectives by improving access to safer and more user-friendly insulin delivery options, strengthening treatment adherence and glycaemic control, and reducing out-of-pocket expenditure for people living with diabetes. As part of a comprehensive diabetes care package, insulin analogue pens can contribute to better health outcomes while advancing equitable access to quality NCD services in Kenya.

Diabetes incidence is a growing public health challenge in Kenya and globally. In Kenya, a variety of medicines are currently used to manage type 1 diabetes, including human insulin in vials and insulin analogues in pens. Globally, only 50 per cent of people who need insulin have access to it, and ongoing human insulin shortages, combined with increased demand over the next decade, risk further exacerbating these gaps.<sup>2</sup>

Insulin analogues are shown to be more clinically effective in treating diabetes, primarily due to lower rates of hypoglycaemic events. This is in part due to their use in basal bolus regimens that more closely mimic normal physiological insulin patterns and allow flexibility in dosing for people who vary their food intake and/or experience food insecurity. They are of particular importance in

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<sup>1</sup> Onteri SN, Kariuki J, Mathu D, Wangui AM, Magige L, Mutai J, et al. Diabetes health care specific services readiness and availability in Kenya: implications for universal health coverage. PLoS Glob Public Health. 2023 Sep 27;3(9):e0002292. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10529624/>

<sup>2</sup> World Health Organization. Diabetes [Internet]. Geneva: WHO; [cited 2026 Jun 25]. Available from: [https://www.who.int/health-topics/diabetes#tab=tab\\_1](https://www.who.int/health-topics/diabetes#tab=tab_1)

Kenya, where studies have found very high levels of hypoglycaemia.<sup>3</sup> The introduction of these products in sub-Saharan Africa has been associated with significant improvements in HbA1c and reductions in episodes of diabetic ketoacidosis.<sup>4</sup> In addition, insulin pen and treatment adherence.<sup>5,6</sup> In recognition of their clinical benefits, insulin analogues have already been adopted into the Kenyan National Essential Medicines List and Kenya's National Clinical Guidelines on the Management of Diabetes.<sup>7,8</sup>

Insulin analogue pens have been introduced in Kenya through the Changing Diabetes in Children (CDiC) programme, where more than 8,000 children currently benefit from these products, as well as through Médecins Sans Frontières (MSF). However, these are not universally available, and many young adults will need to transition to human insulin in vials when they graduate from these programmes.

Although insulin analogue pens have been notoriously expensive, prices are declining. For example, Brazil, South Africa, China, and MSF are procuring insulin analogue pens at below USD 3 per pen as of 2025.<sup>9,10,11</sup> The price tag can go much lower. A 2024 MSF study by Barber et al.

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<sup>3</sup> Ngweri T, Were F, Predieri B, Ngugi P, Iughetti L. Glycaemic control in Kenyan children and adolescents with type 1 diabetes mellitus. *Int J Endocrinol.* 2015;2015:761759. Available from: <https://doi.org/10.1155/2015/761759>

<sup>4</sup> Besançon S, Haynes A, Domon Togo A, Sandy JL, Maniam J, Sidibe AT, et al. Marked improvement in HbA1c following introduction of biosimilar insulin to treatment regimen of children and youth with type 1 diabetes in Mali: a randomised controlled trial. *Diabet Med.* 2025;42(5):e70007. Available from: <https://doi.org/10.1111/dme.70007>

<sup>5</sup> Asakura T, Seino H, Nakano R, Muto T, Toraiishi K, Sako Y, et al. Insulin delivery with FlexPen: dose accuracy, patient preference and adherence. *Expert Opin Drug Deliv.* 2008 Aug;5(8):915-20. Available from: <https://pubmed.ncbi.nlm.nih.gov/18713000/>

<sup>6</sup> Médecins Sans Frontières Access Campaign, T1International. Defeating the double standard in diabetes care [Internet]. 2024 May 8 [cited 2026 Jun 22]. Available from: <https://msfaccess.org/defeating-double-standard-diabetes-care>

<sup>7</sup> Kenya Ministry of Health. Kenya Essential Medicines List 2023 [Internet]. Nairobi: Ministry of Health; 2023 [cited 2026 Jun 16]. Available from: [http://guidelines.health.go.ke:8000/media/Kenya\\_Essential\\_Medicines\\_List\\_2023\\_qbkhTIV.pdf](http://guidelines.health.go.ke:8000/media/Kenya_Essential_Medicines_List_2023_qbkhTIV.pdf)

<sup>8</sup> Médecins Sans Frontières Access Campaign, T1International. Defeating the double standard in diabetes care [Internet]. 2024 May 8 [cited 2026 Jun 22]. Available from: <https://msfaccess.org/defeating-double-standard-diabetes-care>

<sup>9</sup> Brasil. Ministério da Saúde. Contrato nº 265/2025, Processo nº 25000.006223/2024-97 [Internet]. Brasília: Ministério da Saúde; 2025 [cited 2026 Jun 25]. Available from: <https://www.gov.br/saude/pt-br/acao-a-informacao/licitacoes-e-contratos/contratos-dlog/dlog-2025/contrato-no-265-2025-processo-no-25000-006223-2024-97/contrato-no-265-2025>

<sup>10</sup> South Africa. National Department of Health. Analogue insulin essential medicines list (EML) status with annexures [Internet]. Pretoria: National Department of Health; 2024 Oct 17 [cited 2026 Jun 25]. Available from: [https://www.health.gov.za/wp-content/uploads/2024/10/Analogue-insulin-EML-status-with-Annexures\\_17-October-2024.pdf](https://www.health.gov.za/wp-content/uploads/2024/10/Analogue-insulin-EML-status-with-Annexures_17-October-2024.pdf)

<sup>11</sup> Yuan J, Li M, Jiang X, Lu ZK. National volume-based procurement (NVBP) exclusively for insulin: towards affordable access in China and beyond. *BMJ Glob Health* [Internet]. 2024 Jan 16;9(1):e014489 [cited 2026 Jun 25]. Available from: <https://gh.bmj.com/content/9/1/e014489>

demonstrated that delivering analogue insulin in a reusable pen device – easily accessible in high-income countries – could cost USD 111 per patient per year, which (at the time of the study's publication) was 30 per cent less than human insulin in a vial.<sup>12</sup> In addition, non-profit brands are offering alternatives in the region, with prices of around USD 2 per pen.<sup>13</sup>

Kenya has an opportunity and imperative to introduce analogue insulin pens into the SHA, standardise diabetes care across the country, and ensure high-quality and person-centred care.

## 2. Background:

### Demographics of diabetes

Diabetes is an increasing public health challenge globally and in Kenya. The number of people living with type 1 diabetes worldwide is projected to rise from 8.4 million in 2021 to more than 13 million by 2040, with the greatest relative increases expected in low- and middle-income countries.<sup>14</sup>

In Kenya, an estimated 821,500 adults, representing approximately 3 per cent of the adult population, were living with diabetes in 2021.<sup>15</sup> However, it is estimated that up to two-thirds of cases remain undiagnosed, highlighting significant gaps in access to diagnosis and care.<sup>16</sup> Kenya is also among the countries with a high prevalence of type 1 diabetes in children and young people, ranking 44th globally.<sup>17</sup> In a study conducted at Kenyatta National Hospital, in Nairobi, diabetic ketoacidosis accounted for 8 per cent of diabetes-related admissions, with 30 per cent of those affected dying within 48 hours.<sup>18</sup>

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<sup>12</sup> Barber MJ, Gotham D, Bygrave H, et al. Estimated sustainable cost-based prices for diabetes medicines. *JAMA Netw Open* [Internet]. 2024 Mar 27;7(3):e243474 [cited 2026 Jun 25]. Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2816824>

<sup>13</sup> Sanofi. Sanofi Global Health launches nonprofit Impact® brand for 30 medicines in low-income countries [Internet]. Paris: Sanofi; 2022 Jul 4 [cited 2026 Jun 25]. Available from: <https://www.sanofi.com/en/media-room/press-releases/2022/2022-07-04-10-00-00-2473350>

<sup>14</sup> International Society for Pediatric and Adolescent Diabetes (ISPAD). Global incidence, prevalence, and mortality of type 1 diabetes in 2021 with projection to 2040: a modelling study [Internet]. *ESPE Yearbook*. 2020;20:11-5 [cited 2026 Jun 16]. Available from: <https://www.espeyearbook.org/ey/0020/ey0020.11-5>

<sup>15</sup> International Diabetes Federation (IDF). Kenya [Internet]. Brussels: IDF; [cited 2026 Jun 16]. Available from: <https://idf.org/our-network/regions-and-members/africa/members/kenya/>

<sup>16</sup> International Diabetes Federation (IDF). Kenya [Internet]. Brussels: IDF; [cited 2026 Jun 16]. Available from: <https://idf.org/our-network/regions-and-members/africa/members/kenya/>

<sup>17</sup> Access to Medicine Foundation. Access to diabetes care for children and young people [Internet]. Amsterdam: Access to Medicine Foundation; 2025 May 7 [cited 2026 Jun 16]. Available from: [https://accesstomedicinefoundation.org/medialibrary/250507\\_diabetes-report-final.pdf](https://accesstomedicinefoundation.org/medialibrary/250507_diabetes-report-final.pdf)

<sup>18</sup> Jones TLE. Diabetes mellitus: the increasing burden of disease in Kenya. *South Sudan Med J*. 2013 Aug;6(3):60–64. Available from: <https://scispace.com/pdf/diabetes-mellitus-the-increasing-burden-of-disease-in-kenya-2ivr0u4666.pdf>

### High regional prevalence of poor glycaemic control

Across the region, glycaemic control for people living with type 1 diabetes is often poor. Onohuean et al. synthesised evidence across 15 papers to determine the prevalence of poor glycaemic control among people living with diabetes in East Africa. Although this study was dominated by studies investigating people living with type 2 diabetes, poor glycaemic control was consistently high, ranging from 60 per cent to 85 per cent (defined as HbA1c > 7 per cent or fasting blood glucose > 130 mg/dL).<sup>19</sup>

In Kenya, Ngwiri et al. conducted a study of children and adolescents with type 1 diabetes at Kenyatta National Hospital, Presbyterian Church of East Africa Kikuyu Hospital and the Diabetes Care and Training Centre in Nairobi. The median HbA1c of this cohort was 11.1 per cent, with 28 per cent achieving reasonable glycaemic control (defined as an HbA1c of 8 per cent or less). Children aged 12 and above had worse outcomes, with only 4 per cent achieving reasonable control. The percentage of children experiencing severe hypoglycaemia was 53.6 per cent.<sup>20</sup> At the time of this study, 69 per cent of people were using mixed formulations, with the rest using intermediate acting insulin alone or together with a short acting variety in a home-prepared mixture.<sup>21</sup>

A more recent study in Tanzania, including people living with both type 1 and type 2 diabetes, found that 66.4 per cent had poor glycaemic control (defined as HbA1c < 7 per cent or random blood glucose (RBG) < 7mmol/L). Within the people living with type 1 diabetes cohort, 37.8 per cent had poor glycaemic control.<sup>22</sup>

In Moshi, Tanzania, McLarty et al. assessed the glycaemic control of children, adolescents and young adults living with type 1 diabetes, and found a mean HbA1C of 12.3 +/- 2.2 per cent. This cohort used predominantly Insulatard and Actarapid (intermediate and short-acting human insulin) and reported up to two injections per day. 97 per cent had poor glycaemic control (defined as HbA1C > 7.5 per cent).<sup>23</sup>

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<sup>19</sup> Onohuean FE, et al. Poor glycaemic control in East Africa: prevalence, risk factors and public health implications in diabetes management. *Endocrinol Diabetes Metab.* 2026;9:e70233. Available from: <https://doi.org/10.1002/edm2.70233>

<sup>20</sup> Ngwiri T, Were F, Predieri B, Ngugi P, Iughetti L. Glycaemic control in Kenyan children and adolescents with type 1 diabetes mellitus. *Int J Endocrinol.* 2015;2015:761759. Available from: <https://doi.org/10.1155/2015/761759>

<sup>21</sup> Ngwiri T, Were F, Predieri B, Ngugi P, Iughetti L. Glycaemic control in Kenyan children and adolescents with type 1 diabetes mellitus. *Int J Endocrinol.* 2015;2015:761759. Available from: <https://doi.org/10.1155/2015/761759>

<sup>22</sup> Muchunguzi AH, et al. Factors associated with glycaemic control and diabetes complications in patients at Bugando Medical Centre, Mwanza, Tanzania: a cross-sectional study design. *PLoS One.* 2024;19(8):e0308659. Available from: <https://doi.org/10.1371/journal.pone.0308659>

<sup>23</sup> McLarty RP, Alloyce JP, Chitema GG, Msuya LJ. Glycaemic control, associated factors, and acute complications of type 1 diabetes mellitus in children, adolescents and young adults in Tanzania. *Endocrinol Diabetes Metab.* 2021;4(2):e00200. Available from: <https://doi.org/10.1002/edm2.200>

In a retrospective study on complications of type 1 diabetes, conducted in Tanzania with a mean age of 16 years, there was a high prevalence of retinopathy (21.5 per cent) and neuropathy (29.4 per cent), despite a short mean duration of diabetes of 6.2 +/- 4.1 years.<sup>24</sup>

### Current challenges with insulin

Only one in seven people living with type 1 diabetes in Africa have access to insulin, and only half of those who need insulin globally have access to it.<sup>25,26</sup> Over the next decade, insulin demand is projected to increase by 39 in sub-Saharan Africa, reflecting both the rising disease burden and the population.<sup>27</sup>

Despite the clear and rising need for insulin, shortages and stockouts remain a global challenge across geographies and income groups.<sup>28</sup> Lead times for human insulins are extended, taking up to 20 weeks, with Ministries of Health reporting delays for receiving human insulin vials in South Africa.<sup>29,30</sup> Kenya faces similar challenges, with extended periods of stockouts lasting up to three months, resulting in people procuring insulin from the private sector at highly inflated prices.<sup>31</sup> Additionally, insulin manufacturing companies have undergone targeted portfolio adjustments, resulting in the discontinuation of multiple products, predominantly human insulin products. This

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<sup>24</sup> McLarty RP, Alloyce JP, Chitema GG, Msuya LJ. Glycaemic control, associated factors, and acute complications of type 1 diabetes mellitus in children, adolescents and young adults in Tanzania. *Endocrinol Diabetes Metab.* 2021;4(2):e00200. Available from: <https://doi.org/10.1002/edm2.200>

<sup>25</sup> World Health Organization. Diabetes [Internet]. Geneva: WHO; [cited 2026 Jun 25]. Available from: [https://www.who.int/health-topics/diabetes#tab=tab\\_1](https://www.who.int/health-topics/diabetes#tab=tab_1)

<sup>26</sup> Médecins Sans Frontières (MSF) Access Campaign, T1International. Defeating the double standard in diabetes care [Internet]. Geneva: MSF Access Campaign; 2024 May [cited 2026 Jun 16]. Available from: <https://msfaccess.org/defeating-double-standard-diabetes-care>

<sup>27</sup> Clinton Health Access Initiative (CHAI). Insulin market memo [Internet]. Boston: CHAI; 2025 Nov [cited 2026 Jun 16]. Available from: <https://www.clintonhealthaccess.org/wp-content/uploads/2025/11/Insulin-Market-Memo-Nov2025.pdf>

<sup>28</sup> South African National Department of Health. Notice: Update on insulin availability with annexure [Internet]. Pretoria: National Department of Health; 2025 Oct 17 [cited 2026 Jun 16]. Available from: <https://www.health.gov.za/wp-content/uploads/2025/10/Circular-Update-on-Insulin-Availability-17-October-2025.pdf>

<sup>29</sup> South African National Department of Health. Notice: Update on insulin availability with annexure [Internet]. Pretoria: National Department of Health; 2025 Oct 17 [cited 2026 Jun 16]. Available from: <https://www.health.gov.za/wp-content/uploads/2025/10/Circular-Update-on-Insulin-Availability-17-October-2025.pdf>

<sup>30</sup> NCD Policy Lab. Documenting global insulin shortages and stockouts 2023–2025: comprehensive overview using various data sources [Internet]. NCD Policy Lab; 2025 [cited 2026 Jun 16]. Available from: <https://ncdpolicylab.org/resources/factsheets/documenting-global-insulin-shortages-and-stockouts-2023-2025-comprehensive-overview-using-various-data-sources>

<sup>31</sup> PATH. The journey of the pill: findings of the NCD commodity supply chain assessment in Kenya [Internet]. Seattle: PATH; 2020 Aug 25 [cited 2026 Jun 26]. Available from: [https://media.path.org/documents/Kenya\\_The\\_Journey\\_of\\_the\\_Pill\\_Aug25\\_2020Final.pdf](https://media.path.org/documents/Kenya_The_Journey_of_the_Pill_Aug25_2020Final.pdf)

includes human insulin pens, long-acting insulin analogues (Levemir) and mixed insulin analogues.<sup>32</sup>

### UHC and person-centered care

Despite the increasing burden of diabetes in Kenya, access to comprehensive diabetes care remains uneven, particularly for people requiring lifelong insulin therapy. Achieving Universal Health Coverage (UHC) for diabetes requires not only access to insulin medicines but also to appropriate delivery devices that support safe, effective and person-centred care alongside tools for monitoring glucose. Studies have shown that insulin pens improve ease of administration, adherence, dosing accuracy and quality of life for people living with diabetes, particularly children, adolescents requiring multiple daily injections.<sup>33</sup> Expanding access to insulin pens through inclusion in the SHA benefits package would support improved diabetes management while reducing long-term complications and the financial burden on people and the health system.

### MSF Interventions

MSF has committed to improving the quality of care for people living with diabetes across its programmes globally. As part of this effort, MSF is transitioning from human insulin in vials to insulin analogues delivered through pen devices, which can improve ease of use, dosing accuracy and treatment adherence.<sup>34</sup> In Kenya, a mixed methods operational research study is currently underway in Dagahaley refugee camp, documenting user and healthcare worker experiences with the introduction of analogue insulin pens and continuous glucose monitoring devices. The operational study will transition a cohort of 100 people to insulin pen use, helping to generate evidence on the feasibility, acceptability and impact of insulin pens in humanitarian settings. In parallel, seventeen people living with diabetes in Marindi and Nyalkinyi, Homa Bay County, have switched to insulin pens since 2025.

MSF introduced pen devices in Carnot, Central African Republic and Aweil, South Sudan in 2025, with 95 per cent of people using pens in Aweil and 23 per cent using pens in Carnot (n=82 and 182, respectively). Evaluation of this intervention is currently ongoing, and data can be shared when finalised alongside associated outcomes.

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<sup>32</sup> European Medicines Agency (EMA). Novo Nordisk insulin (human insulin) (various short-, rapid-, intermediate-, mixed- and long-acting forms): supply shortage information [Internet]. Amsterdam: EMA; [cited 2026 Jun 16]. Available from: <https://www.ema.europa.eu/en/medicines/human/shortages/novonordisk-insulin-human-insulin-various-short-rapid-intermediate-mixed-long-acting-forms>

<sup>33</sup> Asakura T, Seino H, Nakano R, Muto T, Toraiishi K, Sako Y, et al. Insulin delivery with FlexPen: dose accuracy, patient preference and adherence. *Expert Opin Drug Deliv*. 2008 Aug;5(8):915-20. Available from: <https://pubmed.ncbi.nlm.nih.gov/18713000/>

<sup>34</sup> Médecins Sans Frontières Access Campaign, T1International. Defeating the double standard in diabetes care [Internet]. 2024 May 8 [cited 2026 Jun 22]. Available from: <https://msfaccess.org/defeating-double-standard-diabetes-care>

### 3. Proposed interventions

The proposed intervention is to include insulin analogue pens and pen needles in the SHA, as part of a comprehensive diabetes package for people living with type 1 diabetes: long-acting and rapid-acting insulin analogues should be added to the SHA, with insulin glargine and insulin degludec included for long-acting insulins, and insulin lispro, insulin aspart and insulin glulisine for rapid-acting insulins, as stated in Kenya's National Guidelines for Diabetes.<sup>35</sup> This proposal includes biosimilar insulins, pre-filled pens and cartridges.

The evidence supporting this proposed intervention has been arranged into clinical evidence, social impact, health system level benefits and economic benefits.

### 4. Supporting Evidence

#### 4.1 Clinical effectiveness

##### Long-acting insulins

Long-acting insulin analogues can enable more people living with type 1 and type 2 diabetes mellitus to achieve better glycaemic control, with lower rates of severe hypoglycaemia events and increased flexibility in timing of administration than is possible with human insulin. Systematic reviews and meta-analyses have found benefits for long-acting insulins in terms of reducing hypoglycaemic episodes and improving glycaemic control.

For long-acting insulin analogues, a meta-analysis of 285 randomised controlled trials shows switching to long-acting insulin analogues from human Neutral Protamine Hagedorn (NPH) insulin has a small improvement in HbA1c, reduces the risk of nocturnal and severe hypoglycaemia and is associated with less weight-gain.<sup>36</sup> Similarly, a systematic review conducted by Tricco et al. found that both ultra-long-acting and long-acting insulin were superior to intermediate-acting

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<sup>35</sup> Kenya. Ministry of Health, Division of Non-Communicable Diseases. National clinical guidelines on management of diabetes mellitus [Internet]. Nairobi: Ministry of Health; 2024 Jun 1 [cited 2026 Jun 25]. Available from: <http://guidelines.health.go.ke/#/category/10/528/meta>

<sup>36</sup> Monami M, Marchionni N, Mannucci E. Long-acting insulin analogues vs. NPH human insulin in type 1 diabetes: a meta-analysis. *Diabetes Obes Metab* [Internet]. 2009;11(4):372–378 [cited 2026 Jun 25]. Available from: <https://doi.org/10.1111/j.1463-1326.2008.00976.x>

insulin in reducing HbA1c, fasting plasma glucose, weight gain, and the incidence of major, serious or nocturnal hypoglycaemia.<sup>37</sup>

A 2021 Cochrane review compared the effects of long-term treatment with (ultra-) long-acting insulin analogues to NPH insulin.<sup>38</sup> There was a reduction in severe hypoglycaemia with insulin detemir and insulin glargine, compared to human insulin, including severe nocturnal hypoglycaemia.

### Rapid-acting insulins

Rapid-acting insulin analogues can enable more people with diabetes to attain better glycaemic control, with more flexibility in administration timing and reduced severe hypoglycaemic episodes.<sup>39</sup> The similarity in pharmacokinetic properties between rapid-acting insulin analogues and naturally produced insulin presents a remarkable advantage of analogues over human insulins.<sup>40</sup> Key advantages of rapid-acting insulin analogues are their ability to support a basal-bolus regimen that closely mimics normal physiological insulin patterns, making this a fundamental approach for managing type 1 diabetes. Additionally, the reduction in total hypoglycaemic episodes, nocturnal hypoglycaemia, severe hypoglycaemia, postprandial glucose, and HbA1c for use in type 1 diabetes improves the safety profile of insulin for those living with diabetes.<sup>41,42</sup>

Further studies conducted in low- and middle-income countries including the switch to basal-bolus regimens, have shown marked improvement in HbA1c and reduction of diabetic ketoacidosis,

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<sup>37</sup> Tricco AC, Ashoor HM, Antony J, Bouck Z, Rodrigues M, Pham B, et al. Comparative efficacy and safety of ultra-long-acting, long-acting, intermediate-acting, and biosimilar insulins for type 1 diabetes mellitus: a systematic review and network meta-analysis. *J Gen Intern Med* [Internet]. 2021;36(8):2310–2320 [cited 2026 Jun 25]. Available from: <https://doi.org/10.1007/s11606-021-06642-7>

<sup>38</sup> Hemmingsen B, Metzendorf M-I, Richter B. (Ultra-)long-acting insulin analogues for people with type 1 diabetes mellitus. Cochrane Metabolic and Endocrine Disorders 31 Group, editor. *Cochrane Database of Systematic Reviews* [Internet]. 2021 Mar 4 [cited 2021 Apr 3]; Available from: <http://doi.wiley.com/10.1002/14651858.CD013498.pub2>

<sup>39</sup> Melo KFS, Bahia LR, Pasinato B, Porfirio GJM, Martimbianco AL, Riera R, et al. Short-acting insulin analogues versus regular human insulin on postprandial glucose and hypoglycemia in type 1 diabetes mellitus: a systematic review and meta-analysis. *Diabetol Metab Syndr*. 2019 Jan 3;11:2. Available from: <https://doi.org/10.1186/s13098-018-0397-3>

<sup>40</sup> Eledrisi M, Ibn-Mas'ud Danjuma M. Comparison of insulin analogues and human insulins: a narrative review. *J Diabetes Endocr Pract*. 2024;7(1):5-14. Available from: <https://doi.org/10.1055/s-0043-1771027>

<sup>41</sup> Plank J, Siebenhofer A, Berghold A, Jeitler K, Horvath K, Mrak P, et al. Systematic review and meta-analysis of short-acting insulin analogues in patients with diabetes mellitus. *Arch Intern Med*. 2005 Jun 13;165(12):1337-44. Available from: <https://doi.org/10.1001/archinte.165.12.1337>

<sup>42</sup> Melo KFS, Bahia LR, Pasinato B, Porfirio GJM, Martimbianco ALC, Riera R, et al. Short-acting insulin analogues versus regular human insulin on postprandial glucose and hypoglycaemia in type 1 diabetes mellitus: a systematic review and meta-analysis. *Diabetol Metab Syndr*. 2019 Jan 3;11:2. Available from: <https://doi.org/10.1186/s13098-018-0397-3>

with similar studies expected in Q2 2026 from the Human 1 trial conducted in Tanzania and Bangladesh.<sup>43,44</sup>

### Kenyan Guidelines

In keeping with global clinical evidence and the World Health Organization's (WHO) Essential Medicines List (EML), Kenya's National Guidelines for Diabetes were updated in 2024, stating that most people with type 1 diabetes should be treated with multiple daily injections of prandial and basal insulin, or continuous subcutaneous insulin infusion, and that most individuals with type 1 diabetes should use rapid-acting insulin analogues, an insulin analogue product, to reduce hypoglycaemia.<sup>45</sup>

For the type of insulin, the guidelines recommend:

- Basal insulin options: Human (NPH), Analog (Glargine, Detemir, Degludec)
- Bolus insulin options: Human (Regular/ Soluble), Analog (Lispro, Aspart, Glulisine)
- Premixed insulin alone is not recommended as first line for management of type 1 diabetes, but if basal-bolus regimen is not available/affordable, it may be used (minimum twice a day)

Additionally, Kenya's Essential Medicines List is in line with the WHO EML as it also includes insulin analogues, both long and rapid acting, as shown in Table 1.<sup>46</sup>

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<sup>43</sup> Besançon S, Haynes A, Domon Togo A, Sandy JL, Maniam J, Sidibe AT, et al. Marked improvement in HbA1c following introduction of biosimilar insulin to treatment regimen of children and youth with type 1 diabetes in Mali: a randomised controlled trial. *Diabet Med.* 2025;42(5):e70007. Available from: <https://doi.org/10.1111/dme.70007>

<sup>44</sup> International Alliance for Diabetes Action (IADA). HumAn-1 [Internet]. [cited 2026 Jun 22]. Available from: <https://www.iadadiabetes.org/human-1>

<sup>45</sup> Ministry of Health (Kenya). National clinical guidelines on management of diabetes mellitus 2024 [Internet]. Nairobi: Division of Non-Communicable Diseases; 2024 [cited 2026 Jun 22]. Available from: [http://guidelines.health.go.ke:8000/media/National\\_DM\\_Guidelines\\_Version\\_15\\_2024\\_Signed-compressed.pdf](http://guidelines.health.go.ke:8000/media/National_DM_Guidelines_Version_15_2024_Signed-compressed.pdf)

<sup>46</sup> Kenya Ministry of Health. Kenya Essential Medicines List 2023 [Internet]. Nairobi: Ministry of Health; 2023 [cited 2026 Jun 16]. Available from: [http://guidelines.health.go.ke:8000/media/Kenya\\_Essential\\_Medicines\\_List\\_2023\\_qbkhTIV.pdf](http://guidelines.health.go.ke:8000/media/Kenya_Essential_Medicines_List_2023_qbkhTIV.pdf)

Name of medicine	Insulin Type	WHO EML	Kenya EML
Intermediate-acting insulin (NPH)	Human insulin	x	x
Long-acting basal, Glargine	Analogue insulin	x	x
Long-acting, Detemir	Analogue insulin	x	x
Pre-mixed, short and medium (20 per cent regular + 70 per cent NPH)	Human insulin		x
Pre-mixed ultra short and intermediate (25 per cent Ultrashort acting + 75 per cent intermediate)	Analogue insulin		x
Short-acting, Lispro and Aspart	Analogue insulin		x
Short-acting	Human insulin		x

Table 1: Kenya's National Essential Medicines List compared to WHO Essential Medicines List

### Pen devices

Prefilled pen devices, or cartridges, offer an alternative to insulin vials and syringes for delivery of insulin. Insulin pens offer greater convenience, portability, and dosing accuracy, making them suitable for people with active lifestyles, those who are displaced, and those with dexterity or visual issues.

Pen devices showed better results in mean HbA1c change, frequency of hypoglycaemia, adherence and persistence compared to vials and syringes in a systematic review comparing pen devices to vials and syringes. In the same review, studies regarding preference showed a clear tendency in favour of pen devices.<sup>47,48,49</sup> With regards to person preference, pens were preferred

<sup>47</sup> Ramadan WH, Khreis NA, Kabbara WK. Simplicity, safety, and acceptability of insulin pen use versus the conventional vial/syringe device in patients with type 1 and type 2 diabetes mellitus in Lebanon. *Patient Prefer Adherence*. 2015 Mar 27;9:517-28. Available from: <https://doi.org/10.2147/PPA.S78225>

<sup>48</sup> Singh R, Samuel C, Jacob JJ. A comparison of insulin pen devices and disposable plastic syringes: simplicity, safety, convenience and cost differences. *Eur Endocrinol*. 2018;14(1):47-51. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC5954595/>

<sup>49</sup> Korytkowski M, Bell D, Jacobsen C, Suwannasari R, FlexPen Study Team. A multicentre, randomised, open-label, comparative, two-period crossover trial of preference, efficacy, and safety profiles of a prefilled, disposable pen and conventional vial/syringe for insulin injection in patients with type 1 or 2 diabetes

by 83 per cent of people living with diabetes in a study by MSF and T1 International, and in a second study in Lebanon they were found to be simpler, safer and more convenient to use.<sup>50,51</sup>

### Pen use in programmes in Kenya (CDiC and MSF)

The Changing Diabetes in Children (CDiC) project is a public-private partnership, aiming to improve access to diabetes care for children with type 1 diabetes. Within Kenya, the programme has over 8,000 beneficiaries. According to CDiC, initially, these people living with diabetes were started on insulin vials and syringes and have now transitioned to insulin analogue pens. Evaluation is underway in seven clinics.

MSF has committed to using insulin analogue pens in both projects, in Homa Bay and Dagahaley Camp.

### Wider evidence of acceptability

Across the continent, insulin analogue pens are increasingly being used. In Mali, a randomised controlled trial of 260 children and youth with type 1 diabetes investigated the introduction of insulin analogues into the treatment regimen. Over a 12-month period, there was a mean HbA1c decrease from 11.6 per cent to 8.1 per cent in the intervention group, compared to 11.4 per cent to 10.7 per cent in the control group. The proportion of participants with HbA1c ( $\geq 14$  per cent) decreased from 38.5 per cent to 0 per cent in the intervention group, versus from 40.6 per cent to 21.9 per cent in the control group. Additionally, there was a reduction of 1.5 per cent in episodes of diabetic ketoacidosis in the intervention arm, from a baseline of 29.2 per cent admissions for diabetic ketoacidosis in the preceding 12 months, compared to no change in the proportion admitted for diabetic ketoacidosis in the control arm.<sup>52</sup>

## 4.2 Social benefits

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mellitus. *Clin Ther.* 2003 Nov;25(11):2836-48. Available from: [https://doi.org/10.1016/S0149-2918\(03\)80337-5](https://doi.org/10.1016/S0149-2918(03)80337-5)

<sup>50</sup> Médecins Sans Frontières (MSF) Access Campaign, T1International. Defeating the double standard in diabetes care [Internet]. Geneva: MSF Access Campaign; 2024 May [cited 2026 Jun 16]. Available from: <https://msfaccess.org/defeating-double-standard-diabetes-care>

<sup>51</sup> Ramadan W, Kreis N, Kabbara – Simplicity Safety, and acceptability of insulin pen use versus the conventional vial/syringe device in patients with type 1 and type 2 diabetes mellitus in Lebanon. *Patient Prefer Adherence.* 2015; 27(9):517-28. Available from: <https://pubmed.ncbi.nlm.nih.gov/25848231/>

<sup>52</sup> Besançon S, Haynes A, Domon Togo A, Sandy JL, Maniam J, Sidibe AT, et al. Marked improvement in HbA1c following introduction of biosimilar insulin to treatment regimen of children and youth with type 1 diabetes in Mali: a randomised controlled trial. *Diabet Med.* 2025;42(5):e70007. Available from: <https://doi.org/10.1111/dme.70007>

Insulin pens help integrate diabetes management into everyday life by offering greater convenience, flexibility and discretion in insulin administration. Their portable design makes them easy to carry and less susceptible to breakage if dropped, compared to traditional vials and syringes.<sup>53</sup> This is particularly beneficial for people who are frequently on the move, as well as those living in humanitarian or resource-constrained settings. Insulin pens can also help reduce the stigma associated with insulin use, as their discreet design allows users to administer insulin more comfortably in public or around peers. Many users report feeling less self-conscious when using insulin pens, which can contribute to improved adherence to treatment and better long-term diabetes management.<sup>54</sup>

### Double standards

There is a stark double standard in diabetes care whereby human insulin in vials remains the basis for care for people living with diabetes in low- and middle-income countries while insulin analogues in pens are readily available for people living with diabetes in high-income countries. This double standard is also reflected in the contrast between remaining life expectancy for 10-year-old children diagnosed with type 1 diabetes in 2021. In low-income countries, the remaining life expectancy is estimated to be only 13 years, compared with 61 years in high-income countries.<sup>55</sup> Additionally, 47 per cent of the estimated 175 000 deaths due to type 1 diabetes worldwide in 2021 took place in sub-Saharan Africa and South Asia.<sup>56</sup>

The global double standard in diabetes care is recognised by multiple organisations. In 2025, the Clinton Health Access Initiative (CHAI) reported that, “without deliberate intervention, this divide could harden into two parallel systems, offering different standards of care based on geography and income.”<sup>57</sup> The issue was similarly highlighted in the Lancet Commission on Diabetes report 2020, where they stated that, “basal insulin analogues are better than human or animal insulins for minimising the risk of nocturnal hypoglycaemia and are particularly useful for basal-bolus regimens (i.e., therapy involving multiple injections a day of long-acting or intermediate-acting

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<sup>53</sup> Médecins Sans Frontières (MSF) Access Campaign, T1International. Defeating the double standard in diabetes care [Internet]. Geneva: MSF; 2024 May 8 [cited 2026 Jun 16]. Available from: <https://msfaccess.org/defeating-double-standard-diabetes-care>

<sup>54</sup> Steenkamp D, Eby EL, Gulati N, Liao B. Adherence and persistence to insulin therapy in people with diabetes: impact of connected insulin pen delivery ecosystem. *J Diabetes Sci Technol* [Internet]. 2022 Jul;16(4):995–1002 [cited 2026 Jun 25]. Available from: <https://journals.sagepub.com/doi/10.1177/1932296821997923>

<sup>55</sup> Gregory GA, Robinson TIG, Linklater SE, Wang F, Colagiuri S, de Beaufort C, et al. Global incidence, prevalence, and mortality of type 1 diabetes in 2021 with projection to 2040: a modelling study. *ESPE Yearbook*. 2020;20:11.5. Available from: <https://www.espeyearbook.org/ey/0020/ey0020.11-5>

<sup>56</sup> Gregory GA, Robinson TIG, Linklater SE, Wang F, Colagiuri S, de Beaufort C, et al. Global incidence, prevalence, and mortality of type 1 diabetes in 2021 with projection to 2040: a modelling study. *ESPE Yearbook*. 2020;20:11.5. Available from: <https://www.espeyearbook.org/ey/0020/ey0020.11-5>

<sup>57</sup> Clinton Health Access Initiative (CHAI). Memo: insulin access in low- and middle-income countries still fall short by 2035 [Internet]. Boston: CHAI; 2025 Nov 13 [cited 2026 Jun 16]. Available from: <https://www.clintonhealthaccess.org/report/insulin-market-memo-nov2025/>

insulin and short-acting or rapid-acting insulin at each meal). Nevertheless, human and biosimilar insulins are more affordable options in low- and middle-income countries.<sup>58</sup>

### Continuity of care

Kenya benefits from a strong partnership with CDiC, where over 8,000 children and adolescents living with diabetes are supported with insulin products, glucose monitoring tools and education for people living with diabetes. Recently, these projects have been increasing the use of insulin analogue pens and moving towards a basal bolus regimen, improving the standard of care.

An evaluation conducted of CDiC projects, including in Kenya in 2021, reports that, “staff at implementing facilities were often unclear about whether support for CDiC would continue,” a concern echoed in the Access to Medicine Foundation’s report *Access to diabetes care for children and young people*.<sup>59,60</sup> This report states the programme aims to reach its targets by 2030. The report also notes that, “while this does not necessarily mean they will end their support, it does reiterate the reality that children and young people may not be guaranteed sustained access over the long term if they rely solely on these initiatives.” It further highlights that, “even when children can access these diabetes care initiatives, they eventually age out, highlighting the need for systems that ensure continued support as they grow older.”<sup>61</sup>

When considered globally, these public-private partnership programmes reached only about 8 per cent of the estimated 825,000 children and young people under the age of 30 who needed care in 2023 across the countries where they operate. This figure is likely an overestimate given the high proportion of undiagnosed diabetes.<sup>62</sup>

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<sup>58</sup> Chan JCN, Lim L-L, Wareham NJ, Shaw JE, Orchard TJ, Zhang P, et al. The Lancet Commission on diabetes: using data to transform diabetes care and patient lives. *The Lancet*. 2020 Dec;396(10267):2019–82. Available from: [https://doi.org/10.1016/S0140-6736\(20\)32374-6](https://doi.org/10.1016/S0140-6736(20)32374-6)

<sup>59</sup> Palmer T, et al. Improving access to diabetes care for children: an evaluation of the Changing Diabetes in Children project in Kenya and Bangladesh. *Pediatr Diabetes*. 2021;22(7):1031-41. Available from: <https://doi.org/10.1111/pedi.13277>

<sup>60</sup> Access to Medicine Foundation. Access to diabetes care for children and young people: pharma companies’ current actions and opportunities ahead [Internet]. Amsterdam: Access to Medicine Foundation; 2025 May 13 [cited 2026 Jun 25]. Available from: <https://accesstomedicinefoundation.org/resource/access-to-diabetes-care-for-children-and-young-people-pharma-companies-current-actions-and-opportunities-ahead>

<sup>61</sup> Access to Medicine Foundation. Access to diabetes care for children and young people: pharma companies’ current actions and opportunities ahead [Internet]. Amsterdam: Access to Medicine Foundation; 2025 May [cited 2026 Jun 16]. Available from: <https://accesstomedicinefoundation.org/resource/access-to-diabetes-care-for-children-and-young-people-pharma-companies-current-actions-and-opportunities-ahead>

<sup>62</sup> Access to Medicine Foundation. Access to diabetes care for children and young people: pharma companies’ current actions and opportunities ahead [Internet]. Amsterdam: Access to Medicine Foundation; 2025 May 13 [cited 2026 Jun 25]. Available from: <https://accesstomedicinefoundation.org/resource/access-to-diabetes-care-for-children-and-young-people-pharma-companies-current-actions-and-opportunities-ahead>

### Out of pocket payments and catastrophic costs

Health expenditure on NCDs has significant economic impacts and poverty effects on households in Kenya.<sup>63</sup> Medical and healthcare expenses were among the most significant burdens faced by people with chronic conditions in Kenya.<sup>64</sup>

Studies on costs and affordability of NCDs in Kenya have been conducted. A small study on out-of-pocket spending conducted by T1 International found that 5 out of 7 participants had to skip or delay taking their insulin dose or delay purchasing insulin in order to save money. Some participants spent up to 100 per cent of their income on insulin and glucose monitoring tools.<sup>65</sup> Oyando et al. conducted a study in Bungoma and Kilifi counties among people living with diabetes and /or hypertension on patient costs in public healthcare facilities.<sup>66</sup> For diabetes patients, medicines costs were found to be 52.4 per cent of overall direct costs associated with care, which is the highest direct cost (sample inclusive of people living with type 1 and 2 diabetes).<sup>67</sup> Also, the most expensive antidiabetic regimen identified by the study was an insulin-inclusive regimen.

Similarly, cost and affordability of NCDs in Kenya were assessed by Subramanian et al. The annual costs of diabetes management with insulin were USD 186 in public facilities and USD 541 in private facilities. For diabetes-related complications, costs ranged from USD 1,026.07 to USD 1,995.65 and USD 2,160.51 to USD 16,710.82 in the public and private facilities, respectively. Chronic kidney disease requiring dialysis would demand annual payments of USD 5,338.00 in the public sector and USD 11,024.00 in the private sector. Similarly, the cost for kidney transplant was USD 9,237.00 in the public centre versus USD 19,724.00 in the private centre. Diabetic foot care and retinopathy requiring outpatient management were less than USD 100 per episode in

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[to-diabetes-care-for-children-and-young-people-pharma-companies-current-actions-and-opportunities-ahead](#)

<sup>63</sup> Mwai D, Muriithi M, Mwabu G. Economic effects of non-communicable diseases on household income in Kenya: a comparative analysis perspective. *Public Health Res.* 2016;6(3):83-90. Available from: <https://www.researchgate.net/publication/321050821>

<sup>64</sup> Koros H, Nolte E, Kamano J, Mugo R, Murphy A, Naanyu V, et al. Understanding the treatment burden of people with chronic conditions in Kenya: a cross-sectional analysis using the Patient Experience with Treatment and Self-Management (PETS) questionnaire. *PLoS Glob Public Health.* 2023 Jan 17;3(1):e0001407. Available from: <https://doi.org/10.1371/journal.pgph.0001407>

<sup>65</sup> T1International. T1International out-of-pocket expense survey [Internet]. Boston: T1International; [cited 2026 Jun 16]. Available from: <https://www.t1international.com/access-survey/>

<sup>66</sup> Oyando R, Njoroge M, Nguhiu P, et al. Patient costs of diabetes mellitus care in public health care facilities in Kenya. *Int J Health Plann Manage.* 2020;35(1):290–308. Available from: <https://doi.org/10.1002/hpm.2905>

<sup>67</sup> Oyando R, Njoroge M, Nguhiu P, et al. Patient costs of diabetes mellitus care in public health care facilities in Kenya. *Int J Health Plann Manage.* 2020;35(1):290–308. Available from: <https://doi.org/10.1002/hpm.2905>

the public sector and more than double that cost in the private sector.<sup>68</sup> Notably, a report from the Program for Appropriate Technology in Health (PATH) states that around 85 per cent of the total out-of-pocket costs paid by people living with diabetes in Kenya are due to consumables such as syringes, test strips and insulin.<sup>69</sup>

Nationally, Mwai et al. found that whilst general ailments reduce household income by 13.6 per cent, NCDs reduce household income by 28.6 per cent. NCDs are associated with a 23.1 per cent reduction in household income relative to a household affected by communicable disease. Another key finding is that, although all types of ailments negatively affect household income and welfare, NCDs have more severe impacts.<sup>70</sup>

In a separate Kenyan study, the cost for diabetes care was found to be catastrophic to 75 per cent of people living with diabetes and/or hypertension, at or over the 10 per cent annual household income threshold.<sup>71</sup>

Costs of complications of type 1 diabetes are significant, with a recent study from Tanzania estimating the cost of an admission for diabetic ketoacidosis at USD 103.24 per day.<sup>72</sup> As mentioned in the clinical evidence, in Mali, following the introduction of insulin analogues into the treatment regimen of children and youth living with type 1 diabetes, there was a reduction of 1.5 per cent episodes of diabetic ketoacidosis.<sup>73</sup> Overall, a reduction in episodes of diabetic ketoacidosis following the introduction of analogue insulin pens may also result in a reduction in diabetes related expenditure for individuals as well as the government.

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<sup>68</sup> Subramanian S, Gakunga R, Kibachio J, Gathecha G, Edwards P, Ogola E, et al. Cost and affordability of non-communicable disease screening, diagnosis and treatment in Kenya: patient payments in the private and public sectors. *PLoS One*. 2018 Jan 5;13(1):e0190113. Available from: <https://doi.org/10.1371/journal.pone.0190113>

<sup>69</sup> PATH. Diabetes CarePak project overview [Internet]. Seattle: PATH; 2024 Jan [cited 2026 Jun 16]. Available from: [https://media.path.org/documents/Diabetes\\_CarePak\\_Project\\_Overview\\_2024Jan.pdf](https://media.path.org/documents/Diabetes_CarePak_Project_Overview_2024Jan.pdf)

<sup>70</sup> Mwai D, Muriithi M, Mwabu G. Economic effects of non-communicable diseases on household income in Kenya: a comparative analysis perspective. *Public Health Res*. 2016;6(3):83-90. Available from: <https://www.researchgate.net/publication/321050821>

<sup>71</sup> Oyando R, Njoroge M, Nguhiu P, et al. Patient costs of diabetes mellitus care in public health care facilities in Kenya. *Int J Health Plann Manage*. 2020;35(1):290–308. Available from: <https://doi.org/10.1002/hpm.2905>

<sup>72</sup> Prust ML, Lalama CM, Kehlenbrink S, Akinola OAA, Nyarubamba R, Hasan Flabe A, et al. Economic evaluation of insulin glargine compared with human insulin for youth with type 1 diabetes in Tanzania and Bangladesh. *PLoS One*. 2026 Jan 2;21(1):e0333652. Available from: <https://doi.org/10.1371/journal.pone.0333652>

<sup>73</sup> Besançon S, Haynes A, Domon Togo A, Sandy JL, Maniam J, Sidibe AT, et al. Marked improvement in HbA1c following introduction of biosimilar insulin to treatment regimen of children and youth with type 1 diabetes in Mali: a randomised controlled trial. *Diabet Med*. 2025;42(5):e70007. Available from: <https://doi.org/10.1111/dme.70007>

### **4.3 System level benefits**

Including insulin pens in the SHA benefits package could yield several health system – mainly through individual level – benefits. These include improved diabetes management and adherence, which may reduce the incidence of preventable complications and, consequently, the need for costly higher-level care and hospital admissions. By supporting earlier and more effective glycaemic control, insulin pens may also contribute to reducing the long-term burden on the health system.

From a whole health system perspective, strengthening people's agency and self-management is an important component of effective chronic disease care. A whole-systems approach recognises that health outcomes are shaped not only by the availability of medicines, but also by how people interact with health services, providers, financing systems and treatment technologies across the continuum of care. By enabling patients to more effectively manage their condition at the community and household levels, insulin pens may contribute to reduced pressure on overstretched health facilities, fewer preventable complications and hospital admissions and more coordinated, person-centred diabetes care.

Therefore, the inclusion of insulin pens should not be viewed merely as the introduction of a new product, but as part of strengthening integrated diabetes care delivery across the continuum of care. Incorporating insulin pens into the benefits package could support more coordinated and person-centred service delivery, while also aligning with the national EML and Diabetes Management Guidelines and thus improving standardisation of treatment and reducing inefficiencies associated with fragmented implementation approaches.

In addition, inclusion within the benefits package could address fragmentation of diabetes care, where parallel delivery systems, such as donation programmes and initiatives, operate alongside routine public sector services. Integrating insulin pens into national financing and service delivery mechanisms could strengthen sustainability, reduce reliance on donor-dependent models and promote more equitable access to diabetes care across the health system.

#### 4.4 Economic benefits

Insulin analogue pens are priced at levels that limit affordability, with private prices for insulin analogue pens within Kenya ranging from KES 1,950 to KES 2,751 per pen.<sup>74,75,76,77,78,79,80,81</sup> However, in similar contexts, prices of these products have been significantly reduced through targeted interventions. These reductions have been driven by the introduction of biosimilar products within the continent, alongside changes in manufacturer’s marketing strategy and target markets, and strengthened procurement processes.

#### National procurement prices

Within South Africa, insulin analogue pens are purchased between KES 129 and KES 540 per pen, as shown in Table 2.

<u>Product name</u>	<u>Brand as per contract</u>	<u>Company</u>	<u>Price (ZAR)</u>	<u>Price (USD)</u>	<u>Price (KES)</u>
Long-acting insulin (insulin glargine, 100IU/ml), prefilled pen (3 ml) <sup>8283</sup>	Optisulin Solostar	Sanofi	39.12	2.20	129

<sup>74</sup> Delivery Pharmacy Kenya. Humulin R 10 mL [Internet]. Nairobi: Delivery Pharmacy Kenya; [cited 2025 Nov 22]. Available from: <https://deliverypharmacyke.com/product/humulin-r-10ml/>

<sup>75</sup> Family Drug Mart Kenya. NovoMix 30 FlexPen 100 IU/mL 3 mL (5 pens) [Internet]. [cited 2025 Nov 22]. Available from: <https://familydrugmartkenya.com/product/novomix-30-flexpen-100-iu-ml-3ml-5s/>

<sup>76</sup> Family Drug Mart Kenya. NovoRapid FlexPen 100 IU/mL 3 mL (5 pens) [Internet]. [cited 2025 Nov 22]. Available from: <https://familydrugmartkenya.com/product/novorapid-flexpen-100-iu-ml-3ml-5s/>

<sup>77</sup> Delivery Pharmacy Kenya. Actrapid FlexPen 100 IU/mL 3 mL (5 pens) [Internet]. [cited 2025 Nov 22]. Available from: <https://deliverypharmacyke.com/product/actrapid-flexpen-100iu-ml-5x3ml-insulin/>

<sup>78</sup> ePharmacy Kenya. Levemir insulin FlexPen 100 IU/mL (1 pen cartridge) [Internet]. [cited 2025 Nov 22]. Available from: <https://www.epharmacyke.com/product/levemir-insulin-flexpen-1-pen-cartridge/>

<sup>79</sup> ePharmacy Kenya. Mixtard 30/70 prefilled FlexPen insulin (1 pen) [Internet]. [cited 2025 Nov 22]. Available from: <https://www.epharmacyke.com/product/mixtard-30-70-prefilled-flexpen-insulin-1-pen/>

<sup>80</sup> ePharmacy Kenya. Insulatard insulin 10 mL [Internet]. [cited 2025 Nov 22]. Available from: <https://www.epharmacyke.com/product/insulatard-10mls-insulin-2/>

<sup>81</sup> Delivery Pharmacy Kenya. Humulin N insulin 10 mL vial [Internet]. [cited 2025 Nov 22]. Available from: <https://deliverypharmacyke.com/product/humulin-n-i0ml-vial/>

<sup>83</sup> South African National Department of Health. Notice: ultra-short-acting and long-acting insulin analogue interim essential medicines list status with annexures [Internet]. Pretoria: National Department of Health;

Ultrafast-acting analogue (insulin glulisine, 100IU/ml) pen, prefilled (3 ml) <sup>84</sup>	Apidra Solostar	Sanofi	74.40	4.18	540
Biphasic insulin analogue 30/70 (insulin aspart, 100IU/ml), pen prefilled (3ml) <sup>85</sup>	Novomix 30	Novo Nordisk	69.93	3.95	510

Table 2: Procurement prices for insulin analogue pens in South Africa, presented in Rand (ZAR), US Dollars (USD) and Kenyan Shillings (KES)

### Non-profit brand

Sanofi has launched a non-profit second brand of insulin along with 29 other essential medicines, including insulin analogues in pre-filled pens.<sup>86</sup> These products are registered in 22 of 42 target countries as of November 2025, including Tanzania, Zimbabwe, Niger, Myanmar, Syria, Djibouti, Ghana, Nigeria, Bhutan, Cambodia, the Central African Republic, Chad, the Democratic Republic of Congo, Kyrgyzstan, Laos, Malawi, Tajikistan and Uganda. In Kyrgyzstan, for example, Sanofi's non-profit glargine analogue in pre-filled pens was sold at USD 4 per pen in 2023 -- a price which included all costs (transport, insurance, clearance, tax etc.) -- and which was 38 per cent less expensive than Sanofi's for-profit glargine analogue in pre-filled <sup>87, 88</sup>.

2024 Oct 17 [cited 2026 Jun 16]. Available from: [https://www.health.gov.za/wp-content/uploads/2024/10/Analogue-insulin-EML-status-with-Annexures\\_17-October-2024.pdf](https://www.health.gov.za/wp-content/uploads/2024/10/Analogue-insulin-EML-status-with-Annexures_17-October-2024.pdf)

<sup>84</sup> South African National Department of Health. Notice: ultra-short-acting and long-acting insulin analogue interim essential medicines list status with annexures [Internet]. Pretoria: National Department of Health; 2024 Oct 17 [cited 2026 Jun 16]. Available from: [https://www.health.gov.za/wp-content/uploads/2024/10/Analogue-insulin-EML-status-with-Annexures\\_17-October-2024.pdf](https://www.health.gov.za/wp-content/uploads/2024/10/Analogue-insulin-EML-status-with-Annexures_17-October-2024.pdf)

<sup>85</sup> South African National Department of Health. Contract circular HP06-2024SVP/02: supply and delivery of small volume parenterals and insulin devices to the Department of Health for the period ending 30 April 2027 [Internet]. Pretoria: National Department of Health; 2025 Jun 6 [cited 2026 Jun 16]. Available from: [https://www.health.gov.za/wp-content/uploads/2025/06/HP06-2024SVP\\_02-Contract-Circular-6-June-2025.pdf](https://www.health.gov.za/wp-content/uploads/2025/06/HP06-2024SVP_02-Contract-Circular-6-June-2025.pdf)

<sup>86</sup> Sanofi. 2023 corporate social responsibility: chapter 3 of the 2023 document d'enregistrement universel [Internet]. Paris: Sanofi; 2023 [cited 2026 Jun 16]. Available from: <https://www.sanofi.com/assets/dotcom/content-app/publications/esg-reports/2023-01-01-declaration-of-extra-financial-performance-en.pdf>

<sup>88</sup> Health Action International. Government procurement of insulin: case studies in 11 low- and middle-income countries [Internet]. Amsterdam: Health Action International; 2025 May [cited 2026 Jun 26].

### Biosimilar introduction

As biosimilars become more available, there is evidence that their adoption is associated with reductions in insulin prices.

In both the United States and the European Union, the introduction of biosimilars has reduced originator market share and prices. In the United States, net prices of long-acting insulin products decreased at an annual rate of 8.3 per cent following the introduction of biosimilar insulin glargine (Basaglar), alongside other products including a high-strength branded insulin glargine (u-300) (Toujeo) and degludec (Tresiba) in 2015.<sup>89</sup>

Net prices of short-acting insulin increased at an annual rate of 5.6 per cent from 2012 to 2017 but subsequently decreased from 2018 to 2019 following the introduction of insulin aspart (Fiasp) and lispro (Admelog). In the European Union, the introduction of up to two biosimilars has led to up to 21 per cent reduction in originator price.<sup>90</sup>

In a study by Ewen et al., which examined insulin price and availability surveys across 13 countries in 2016, including Ghana and Ethiopia, matched pairs of originators and biosimilars by presentation were analysed.<sup>91</sup> Biosimilars had lower median prices in 36 cases, were identical in three and were priced higher in 10 cases. In the public sector, median biosimilar prices were consistently cheaper (by 7 per cent – 26 per cent for vials and 2 per cent – 25 per cent for cartridges), except for one case in Ethiopia. In private pharmacies, biosimilars were cheaper (by 3 per cent – 45 per cent for vials; 11 per cent – 26 per cent for cartridges) than originators in 16 of 26 cases, the same price in 2 of 26 cases and higher priced in 8 of 26 cases (by 1 per cent – 26 per cent for vials; 1 per cent–83 per cent for cartridges). In private hospitals, biosimilars were all cheaper (by 13 per cent – 40 per cent vials; 4 per cent – 38 per cent cartridges), with two exceptions.<sup>92</sup>

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Available from: <https://knowledge-action-portal.com/sites/default/files/2026-02/Government%20Procurement%20of%20Insulin%20Report%202025.pdf>

<sup>89</sup> Dickson S, Gabriel N, Gellad WF, et al. Estimated changes in insulin prices and discounts after entry of new insulin products, 2012–2019. *JAMA Health Forum* [Internet]. 2023 Jun 16;4(6):e231430 [cited 2026 Jun 25]. Available from: <https://doi.org/10.1001/jamahealthforum.2023.1430>

<sup>90</sup> Morolla D, Beran D, Ewen M, Raviglione M, von Schoen-Angerer T. Role of biosimilar introduction on insulin glargine prices: a retrospective analysis in 28 European countries. *BMJ Open*. 2025;15(1):e090484. Available from: <https://bmjopen.bmj.com/content/15/1/e090484>

<sup>91</sup> Ewen M, Joosse HJ, Beran D, Laing R. Insulin prices, availability and affordability in 13 low- and middle-income countries. *BMJ Glob Health*. 2019;4(3):e001410. Available from: <https://gh.bmj.com/content/bmjgh/4/3/e001410.full.pdf>

<sup>92</sup> Ewen M, Joosse HJ, Beran D, Laing R. Insulin prices, availability and affordability in 13 low- and middle-income countries. *BMJ Glob Health*. 2019;4(3):e001410. Available from: <https://gh.bmj.com/content/bmjgh/4/3/e001410.full.pdf>

## 5. Conclusion and recommendations

Insulin pens can enhance diabetes management by improving dosing accuracy, ease of use and convenience, while supporting greater treatment adherence among people living with diabetes. Their design may also reduce stigma associated with insulin administration. In turn, these factors can contribute to improved glycaemic control and better health outcomes. Insulin pens have become the standard of care in many high-income countries, reflecting their recognised benefits for both individuals and health systems, including reduced burden on healthcare services and more efficient delivery of care while aligning with national essential medicines lists and diabetes management guidelines, thereby improving treatment standardisation and reducing inefficiencies associated with fragmented implementation approaches.

MSF therefore calls on the Government of Kenya to include analogue insulin pens in the SHA benefits package. Their inclusion in the SHA would have significant benefits, namely:

- Improving clinical outcomes and quality of life for people living with diabetes, achieving a higher standard of care and addressing inequities in access to diabetes care. People living with diabetes in Kenya should not be subject to a double standard of care whereby they are limited to older delivery methods while people in higher-income settings routinely benefit from analogue insulin pens.
- Helping reduce out-of-pocket expenditure for people living with diabetes, supporting Kenya's UHC objectives of ensuring access to healthcare without financial hardship.
- Aligning with the WHO Model EML as well as Kenya's Essential Medicines List and National Clinical Guidelines on the Management of Diabetes.
- Ensuring continuity of care for patients who have already been initiated on insulin pens through programmes such as CDiC, while also expanding access to others who could benefit from this medical tool.