

# Analysis of opioid analgesics consumption in Africa: a longitudinal study from a 20-year continental perspective

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## Summary

**Background** Opioid analgesics are essential for managing acute and chronic pain in diseases such as cancer. Inadequate opioid access remains a major public health concern in low-income regions including Africa. This study aimed to provide updated and comprehensive data on changes in opioid consumption, specifically in Africa.

**Methods** This longitudinal study has updated and expanded upon the International Narcotics Control Board data obtained from 1999 to 2021, assessing opioid consumption trends across all African countries. The defined daily doses for statistical purposes (SDDD) was used to determine the changes in opioid consumption in Africa. In addition, we used sub-analyses of the data to delve into individual substances, income levels, cancer incidence, cancer mortality, and sub-regional cluster analysis (based on the language spoken) to identify possible disparities and inform further research and tailored solutions.

**Findings** Our results indicate a persistently low and stagnant trend in opioid consumption between 2001–03 and 2019–21, from 73 SDDD (95% CI 69–77) to 55 SDDD (32–79). In-depth analysis revealed a morphine consumption increase from 735 SDDD in 1999 to 1115 SDDD in 2021. Moreover, opioid consumption was closely related to country-level income levels, with most of the low-income and lower-middle-income African countries reporting low opioid consumption. Notably, the escalating incidence and mortality rates associated with cancer in Africa indicated a misalignment with the trajectory of opioid use. Additionally, French-speaking African countries exhibited lower opioid usage than the rest of the continent, suggesting avenues for research into cultural, political, and social aspects.

**Interpretation** In the context of global doubling in opioid consumption, Africa has shown insufficient and stagnant opioid consumption during the last 20 years. These findings underscore the need for policy reform to facilitate safe and responsible opioid access in Africa, particularly for legitimate indications such as cancer pain and palliative care.

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## Introduction

Opioid analgesics are essential in managing acute and some chronic pain conditions, particularly cancer and palliative care. For cancer pain, no medication other than opioid analgesics can offer immediate and effective pain relief.<sup>1</sup> WHO has listed opioid analgesics as essential medicines for pain and palliative care.<sup>2</sup> Globally, opioid consumption has doubled every 10 years.<sup>3</sup> However, 92% of the available opioids were consumed by only 17% of the world's population who reside in high-income countries. The remaining 8% of opioids were consumed in low-income and middle-income countries, which constitute 83% of the global population.<sup>4</sup> These findings highlight the disparity in global opioid consumption, with certain regions experiencing excessive usage whereas others grapple with inadequate consumption of opioid analgesics.<sup>4</sup> Therefore, it is inaccurate to portray global opioid consumption as a homogeneous entity, and it is crucial to underscore the unique challenges faced by low-income countries such as those in Africa to ensure equitable access to opioids for pain treatment.

In Africa, in patients with moderate pain that is not adequately controlled with regular non-steroidal anti-inflammatory drugs or paracetamol, opioids such as tramadol, codeine, or low-dose morphine are indicated.<sup>5</sup> If the pain progresses into a more severe form, potent opioids such as morphine, oxycodone, hydromorphone, and fentanyl are then indicated.<sup>5</sup> However, pain management in Africa faces a myriad of challenges, with the shortage of essential opioid formulations particularly hindering effective palliative care.<sup>6</sup> Market barriers and bureaucratic processes impede timely access to opioids, which is further exacerbated by stringent prescription policies.<sup>6</sup> Moreover, health-care professionals in Africa often opt for non-opioid analgesics as a first-line treatment of severe pain over essential opioids.<sup>6</sup> Because most African countries fall in the low-income and lower-middle-income category, opioids are often unaffordable for both individual patients and health-care institutions.<sup>6</sup> The prevailing stigma surrounding pain endurance, palliative medicine, opiophobia, and the fear of opioid use also further complicates the situation.<sup>6</sup>

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For the French translation of the abstract see [Online for appendix 1](#)

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See Online for appendix 2

## Research in context

### Evidence before this study

Before conducting this study, we gathered evidence from the latest International Narcotics Control Board (INCB) data and conducted a literature search within the relevant field. We searched PubMed on Nov 30, 2023 for all article types published between database inception and Nov 30, 2023, with no language restrictions. A full list of search terms is included in appendix 2 (p 4). Existing knowledge about global trends in opioid analgesic use stemmed from two previous studies, covering the periods from 2001 to 2013, and 2015 to 2019. These studies indicated a substantial increase in global opioid analgesic use, which was primarily driven by increases in high-income countries. However, countries with low-income and middle-income levels, such as African nations, experienced persistently low consumption, resulting in huge global disparities. Despite the call for action from the INCB, no study has specifically focused on the African context within the past 20 years, incorporating sub-analyses of individual substances, cancer incidence, cancer mortality, and income levels.

### Added value of this study

In our study encompassing 57 African countries from 1999 to 2021, we have provided specific and up-to-date data and analysis of opioid analgesic consumption in all African countries based on INCB data. Our findings have revealed a low and stagnant trend in opioid consumption across Africa during the past two decades. The analysis of individual opioid substances

also highlights a slight increase in morphine consumption during the last two decades. Sub-analyses of opioid consumption data underscore the insufficiency of opioid use in countries with low-income and lower-middle-income levels and in the French-speaking sub-regions. Moreover, the persistent stagnation of opioid use within African countries during the past 20 years is particularly alarming given the ongoing increases in cancer incidence and mortality, highlighting an enormous unmet need for access to opioid analgesics for palliative care when indicated.

### Implications of all the available evidence

Despite the initial call for action in 2016 in a study by Berterame and colleagues, the issue of insufficient opioid consumption persists in African nations, showing minimal progress or stagnation during the past two decades. Our analysis further highlights pronounced disparities between African countries, particularly when considering the increasing cancer incidence and mortality, in low-income countries versus high-income countries, and in French-speaking versus English-speaking regions, necessitating deeper exploration of cultural and political determinants driving these inequities. Urgent attention and concerted efforts are imperative to address the multifaceted challenges faced by these nations, urging further research, and tailored sub-regional and local solutions to address the overarching predicament across Africa.

Cancer is a pervasive health challenge globally, affecting millions of people each year. Although the burden of cancer is felt worldwide, it is particularly severe in Africa where it is now the fifth leading cause of death.<sup>7</sup> The African population has surged from 778.2 million in 2000 to 1.3 billion in 2021.<sup>8</sup> With the increasing and ageing population, incidence of cancer in Africa has risen from 0.3 million in 2000 to 1.1 million in 2020.<sup>9,10</sup> Moreover, cancer mortality in Africa has risen from 0.38 million in 1999 to 0.66 million in 2019.<sup>11</sup> Notably, pain is experienced by 55% of patients with cancer during anti-cancer therapy<sup>12</sup> and 70–80% of patients with advanced-stage cancers.<sup>13</sup> Untreated or inadequately managed pain severely affects physical and psychological health, functional status, and quality of life of patients with cancer.<sup>14</sup> In the worst-case scenario, pain can result in a reluctance to adhere to medication and can lead to suicidal thoughts.<sup>14</sup> Hence, access to opioids should be classified as a fundamental human right.

Within Africa, French-speaking African countries face distinct challenges due to weaker development indicators that can affect health outcomes.<sup>15</sup> The timely availability of reliable and up-to-date data is essential for health decision-making. However, 85% of publications on opioid use in Africa originated from countries that predominantly speak English.<sup>16</sup> In our study, 24 African countries were

categorised under French-speaking African countries, including 21 francophone African countries with French registered as an official language and three additional countries (Algeria, Morocco, and Tunisia) with a large French-speaking population.<sup>15,17</sup> These countries are part of the French International Federation of Palliative Care and French-African Paediatric Oncology Group with other francophone African countries.<sup>17</sup>

We aimed to assess the opioid consumption trends in African countries during the past two decades using data from 1999 to 2021, and we explore factors contributing to opioid consumption variations, including the effect of individual opioid substances, income levels, cancer incidence and mortality, and the sub-regional language cluster. This study also attempts to look at an underserved sub-region—French-speaking African countries—to identify potential disparities. To our knowledge, this is the first study that compares opioid consumption in African countries over a 20-year timeframe. This information can then guide policies to improve the safe availability of opioid analgesics.

## Methods

### Data sources

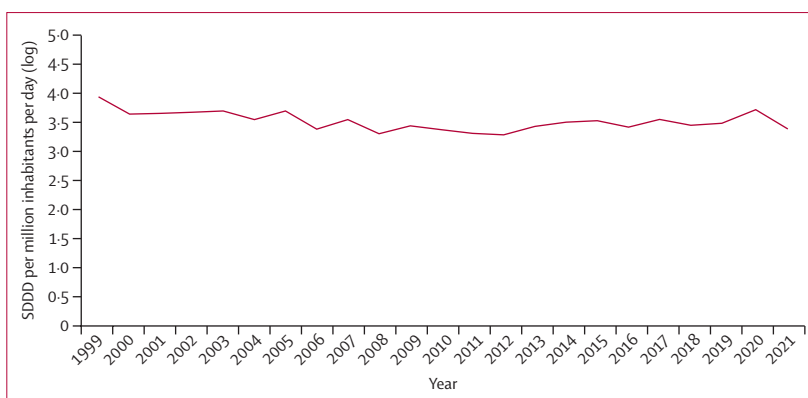
We performed a secondary analysis on the most recent opioid consumption data in African countries. The opioid

consumption data from 1999 to 2021 was obtained from the Narcotics Control and Estimates Section of the International Narcotics Control Board (INCB) on Nov 17, 2023. According to the INCB and the 1961 Convention (Article 1), drug consumption is recorded when the drug has been supplied to any person or enterprise for retail distribution, medical use, or scientific research.<sup>18</sup> Therefore, the consumption data provided by governments in each country, as per the requirements of the 1961 Convention (Article 13 and 20), represent the drug distribution from wholesale to retail but not necessarily the actual administration of the substances.<sup>18</sup> This information was then verified by the INCB using data from export and import notifications. The list of narcotic drugs under the control of the INCB is included in appendix 2 (p 2). Among these narcotic drugs, codeine, dextromoramide, dextropropoxyphene, dihydrocodeine, diphenoxylate, dipipanone, ethylmorphine, fentanyl, hydrocodone, hydromorphone, morphine, nicomorphine, pethidine, phenoperidine, pholcodine, piritamide, opium, oxycodone, and tilidine consumption was reported in Africa and analysed in this study. Total population data<sup>8</sup> and income levels of each African country<sup>19</sup> were retrieved from the World Bank, epidemiological data on cancer incidence were extracted from the WHO Global Cancer Observatory (Globocan) database,<sup>20</sup> and data on mortality were from the Institute for Health Metrics and Evaluation, Global Burden of Disease.<sup>11</sup>

Ethics approval is not required for this study as there is no direct subject involvement. The research exclusively relies on data from the INCB and other online databases, and no information is disclosed that could identify any specific individual.

### Definition of variables

Defined daily doses for statistical purposes (SDDD) is a technical unit of measurement and should not be confused with the prescription dose. SDDD was used because there are no existing internationally agreed standard doses for opioid analgesic prescriptions; hence, SDDD provides an approximate measure of the amount of opioids used and allows for a fair comparison between countries. Opioid use, expressed in SDDD per million inhabitants per day, was calculated with the following formula: annual use divided by 365 days, divided by the population in millions of the country or territory during the year, divided by the defined daily dose.<sup>3</sup> The income level of each African country was defined according to the World Bank's classification into four income groups, which were low-income, lower-middle-income, upper-middle-income, and high-income. The classifications were based on the annual gross national income per capita.<sup>19</sup> Cancer incidence was defined as the number of newly diagnosed cases and mortality was defined as the number of deaths during a specific time period. In terms of language spoken, 57 African countries were divided into



**Figure 1: SDDD of opioid analgesics (log) in African countries from 1999 to 2021**

Data were obtained from the International Narcotics Control Board. SDDD=defined daily doses for statistical purposes.

24 French-speaking African countries and 33 other African countries (appendix 2 p 3).

### Statistical analysis

The time trend of opioid consumption was evaluated and assessed in terms of SDDD in all African countries from 1999 to 2021, to establish the extent of use. The total SDDD in the French-speaking countries and other African countries was obtained and plotted into a single graph with all African countries for the sub-regional cluster analysis. For the time-series analysis, the trend of the SDDD from 1999 to 2021 was determined by a researcher observational method, which interprets the goodness-of-fit of the SDDD and decides if the trend is linear or exponential in nature. Subsequently, the results from 1999 to 2021 were then used to generate a predictive line to estimate the future SDDD trends.

### Role of the funding source

There was no funding source for this study.

### Results

During the past few decades, global opioid consumption has doubled every 10 years with North American, Oceania, and west and central European countries reporting very high opioid use, but consumption has remained very low in low-income countries, particularly in Africa (appendix 2 p 14).<sup>3</sup> We found that opioid consumption in African countries has remained low and stagnant during the last two decades, from 73 SDDD (95% CI 69–77) in 2001–03, to 29 SDDD (22–36) in 2011–13, and 55 SDDD (32–79) in 2019–21 (figure 1; table). The detailed SDDD for each African country have been presented in the table, whereas heatmaps illustrating the evolution of opioid consumption for the years 2001–03, 2011–13, and 2019–21 can be found in appendix 2 (p 15).

Next, we analysed the SDDD of individual opioid substances in Africa, to discern the contribution of each substance to the overall consumption trend. Among

	2001–03 (SDDD [95% CI])	2011–13 (SDDD [95% CI])	2019–21 (SDDD [95% CI])	Absolute change (from 2001–03 to 2011–13)	Absolute change (from 2011–13 to 2019–21)
<b>All African countries</b>					
Africa	73 (69 to 77)	29 (22 to 36)	55 (32 to 79)	-44	26
<b>French-speaking African countries</b>					
Algeria	745 (16 to 1473)	43 (17 to 68)	14 (-13 to 41)	-702	-29
Benin	3 (1 to 4)	9 (2 to 15)	5 (3 to 7)	6	-3
Burkina Faso	1 (0 to 1)	1 (0 to 2)	2 (2 to 2)	0	1
Burundi	10 (-2 to 22)	0*	1 (-1 to 2)	-10	1
Cameroon	4 (-1 to 9)	5 (-2 to 12)	12 (4 to 19)	1	7
Central African Republic	20 (-19 to 60)	0*	0*	-20	0
Chad	0 (0 to 0)	3 (-2 to 7)	0*	3	-3
Comoros	1 (-1 to 2)	0*	4 (0 to 9)	-1	4
Congo	0*	0*	0*	0	0
Côte d'Ivoire	1 (1 to 1)	1 (1 to 2)	3 (3 to 4)	0	2
Democratic Republic of the Congo	19 (9 to 29)	0 (0 to 1)	1 (0 to 1)	-19	1
Djibouti	1 (-1 to 2)	0*	0*	-1	0
Equatorial Guinea	0*	0*	0*	0	0
Gabon	0*	2 (-2 to 5)	31 (9 to 53)	2	29
Guinea	0 (0 to 0)	0*	0 (0 to 1)	0	0
Madagascar	4 (0 to 7)	18 (-17 to 52)	3 (3 to 4)	14	-15
Mali	1 (-1 to 2)	0 (0 to 1)	4 (0 to 9)	-1	4
Morocco	586 (166 to 1005)	15 (0 to 31)	55 (53 to 57)	-571	40
Niger	0*	0*	0*	0	0
Rwanda	1 (0 to 1)	0*	21 (-1 to 44)	-1	21
Senegal	145 (-131 to 421)	3 (0 to 6)	0*	-142	-3
Seychelles	97 (67 to 127)	123 (2 to 243)	253 (200 to 306)	26	130
Togo	1 (1 to 2)	2 (2 to 3)	3 (0 to 6)	1	1
Tunisia	95 (87 to 102)	180 (172 to 189)	285 (28 to 541)	85	105

(Table continues on next page)

these substances, morphine and oxycodone consumption showed a gradual increasing trend for the past decade (figure 2; appendix 2 pp 5–6). Specifically, in-depth analysis revealed a morphine consumption increase from 735 SDDD in 1999 to 1115 SDDD in 2021. Notably, Saint Helena, Seychelles, South Africa, and Tunisia had a relatively higher morphine SDDD compared with the other African countries (appendix 2 p 5), whereas oxycodone consumption was mainly reported by South Africa (appendix 2 p 6).

To ascertain whether the consumption of opioid analgesics in African countries correlates with their income levels, a sub-analysis of SDDD was performed by categorising each African country into low-income, lower-middle-income, upper-middle-income, and high-income groups (appendix 2 pp 7–9). Our findings revealed a positive association between opioid consumption SDDD and income level (figure 3; appendix 2 p 9). Among the upper-middle-income and high-income countries, Mauritius, Seychelles, and South Africa had a relatively higher SDDD, which records 231 SDDD, 239 SDDD, and 827 SDDD opioid consumption in 2021, respectively (appendix 2 pp 7–8). Interestingly, despite being a country

in the lower-middle-income category, Tunisia had a higher SDDD than most of the upper-middle-income and high-income countries, with an SDDD of 545 in 2021 (appendix 2 pp 7–8).

Although cancer incidence and mortality in Africa has consistently risen during the last 20 years (figure 4), the consumption of opioids remains almost unchanged (figure 1). The relationship between cancer incidence and mortality and consumption of opioids in Africa suggests a vast health-care problem: analgesics are not available for cancer pain treatment. Most African countries, excluding South Africa and Saint Helena, exhibit a close proximity to the x-axis, indicating existing cancer incidence and mortality without corresponding access to opioid analgesics (figure 4B, D; appendix 2 pp 10–13). To further explore the interplay between cancer mortality and the trend in consumption of each opioid substance, a time-series analysis was conducted. Among all opioids, we showed that morphine exhibited an increasing consumption trend along with the cancer mortality (appendix 2 p 16).

Ethnolinguistic diversity is an important determinant of outcomes such as income.<sup>21</sup> Therefore, we performed

	2001–03 (SDDD [95% CI])	2011–13 (SDDD [95% CI])	2019–21 (SDDD [95% CI])	Absolute change (from 2001–03 to 2011–13)	Absolute change (from 2011–13 to 2019–21)
(Continued from previous page)					
<b>Other African countries</b>					
Angola	10 (–4 to 24)	5 (–1 to 11)	3 (–1 to 8)	–5	–2
Ascension Island	23 (13 to 33)	82 (33 to 131)	26 (1 to 51)	59	–56
Botswana	44 (–5 to 94)	75 (–6 to 157)	94 (20 to 169)	31	19
Cabo Verde	7 (6 to 8)	32 (20 to 45)	57 (–2 to 116)	25	25
Egypt	36 (11 to 62)	75 (47 to 103)	107 (42 to 173)	39	32
Eritrea	2 (0 to 4)	1 (0 to 1)	0 (0 to 0)	–1	–1
Eswatini	20 (11 to 28)	0*	64 (–2 to 129)	–20	64
Ethiopia	0 (0 to 0)	0*	0*	0	0
The Gambia	0*	0*	0*	0	0
Ghana	42 (29 to 55)	20 (5 to 35)	34 (28 to 41)	–22	14
Guinea-Bissau	0 (0 to 0)	0*	0*	0	0
Kenya	20 (9 to 31)	0*	86 (39 to 134)	–20	86
Lesotho	6 (–1 to 12)	0*	0*	–6	0
Liberia	0*	0*	1 (–1 to 3)	0	1
Libya	35 (28 to 41)	23 (–5 to 51)	0*	–12	–23
Malawi	0*	9 (–8 to 25)	4 (–4 to 12)	9	–5
Mauritania	0*	0*	1 (–1 to 2)	0	1
Mauritius	92 (12 to 172)	58 (–6 to 123)	178 (118 to 238)	–33	119
Mozambique	7 (–2 to 15)	10 (9 to 11)	3 (–3 to 10)	3	–7
Namibia	95 (66 to 124)	79 (–22 to 180)	128 (12 to 245)	–16	49
Nigeria	0 (0 to 1)	1 (0 to 1)	0*	1	–1
Saint Helena	1145 (–171 to 2460)	289 (–102 to 680)	768 (–397 to 1933)	–856	479
São Tomé and Príncipe	37 (–28 to 102)	8 (–8 to 24)	0*	–29	–8
Sierra Leone	21 (3 to 38)	1 (–1 to 2)	3 (1 to 6)	–20	3
Somalia	0*	0*	0*	0	0
South Africa	456 (351 to 561)	358 (288 to 428)	814 (529 to 1099)	–98	456
South Sudan	0*	0*	0*	0	0
Sudan	2 (2 to 2)	0*	0*	–2	0
Tristan da Cunha	120 (–72 to 312)	0*	0*	–120	0
Uganda	23 (14 to 32)	31 (25 to 37)	27 (7 to 47)	8	–4
Tanzania	6 (0 to 12)	5 (2 to 8)	1 (–1 to 2)	–1	–4
Zambia	32 (1 to 63)	32 (10 to 54)	14 (4 to 25)	0	–18
Zimbabwe	63 (–12 to 138)	49 (23 to 76)	35 (–7 to 77)	–14	–14

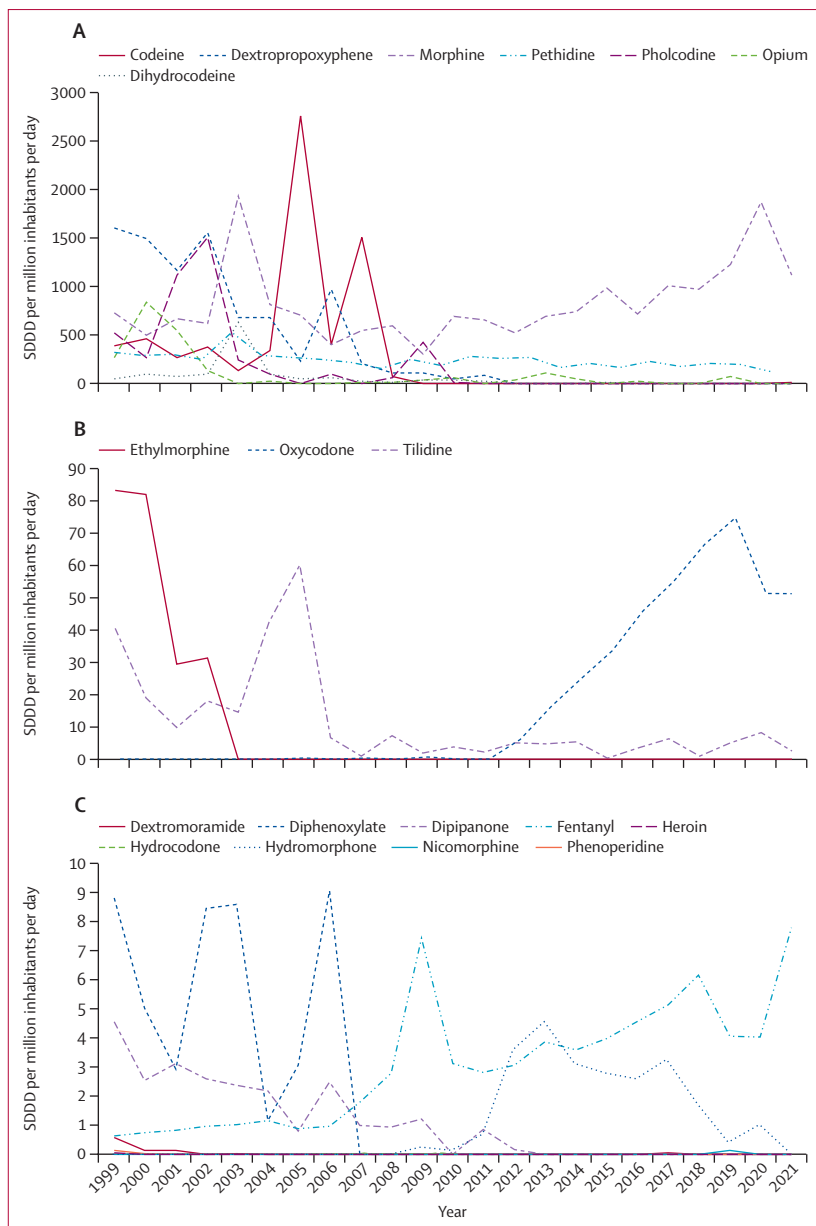
The value represents the mean of 3 years of use (2001–03, 2011–13, and 2019–21) to remove annual variations and provide the most stable use data. Opioid consumption data were provided by the International Narcotics Control Board. SDDD=defined daily doses for statistical purposes. \*Confidence interval was not calculated due to zero use during the time period.

**Table : SDDD use per million inhabitants per day in all African countries for 2001–03, 2011–13, and 2019–21**

sub-regional cluster analysis based on language spoken in different regions within Africa. Our results have shown that French-speaking African countries generally exhibited lower SDDD than other African countries throughout most of the analysed time period, except 2000–01 (figure 5). Moreover, when we break the African countries further down into French-speaking African countries, English-speaking African countries, and other African countries, we observed that the SDDD of French-speaking African countries remained lower than the English-speaking countries and other African countries (appendix 2 pp 17–19).

## Discussion

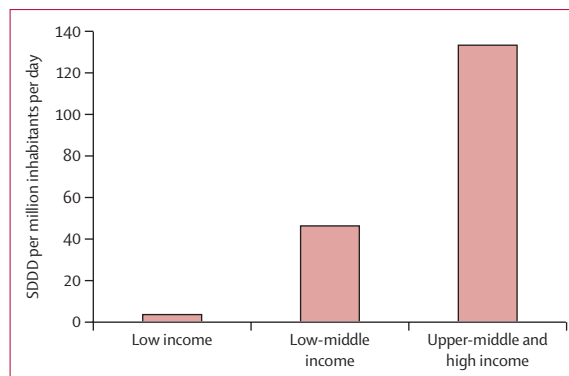
Global consumption of opioid analgesics has increased tremendously throughout the past 30 years.<sup>22</sup> The worldwide use of opioids has doubled between the years 2001–03 and 2011–13, mainly driven by high-income countries.<sup>3</sup> Nonetheless, the increase in opioid consumption in Africa has been negligible since the 1980s.<sup>3,22</sup> To our knowledge, we have shown for the first time that opioid consumption in African countries remained low and stagnant from 1999 to 2021, despite the increase in cancer incidence and mortality. Furthermore, we have shown that African countries with



**Figure 2: SDDD of individual opioid substances in African countries from 1999 to 2021**  
 (A) Opioid substances with a high SDDD were codeine, dextropropoxyphene, morphine, pethidine, pholcodine, opium, and dihydrocodeine. (B) Opioid substances with a moderate SDDD were ethylmorphine, oxycodone, and tilidine. (C) Opioids with a low SDDD, comprising dextromoramide, diphenoxylate, dipipanone, fentanyl, heroin, hydrocodone, hydromorphone, nicomorphine, and phenoperidine. Data were obtained from the International Narcotics Control Board. SDDD=defined daily doses for statistical purposes.

low-income and lower-middle-income levels versus high-income and those that speak French versus English have a lower opioid consumption when compared with their counterparts within the same continent.

The huge disparity between high-income countries such as the USA and low-income countries in regions such as Africa has shown that it is inaccurate to refer to global opioid consumption as a homogeneous entity.<sup>3</sup> Opioid consumption in North America increased



**Figure 3: Sub-analysis of opioid SDDD based on the income level in Africa**  
 The data for income levels of each African country were retrieved from the World Bank, whereas the SDDD data were obtained from the International Narcotics Control Board. SDDD=defined daily doses for statistical purposes.

between 2001–03 and 2011–13, but consumption is largely for non-medical purposes.<sup>3</sup> Hence, concerns regarding opioid abuse, addiction, and overdose in North America have led to tighter control of opioids and increased reticence from physicians and the public to prescribe and consume opioids.<sup>23</sup> In Africa, opioid consumption reduced from 2001–03 to 2011–13, which was shown in the study by Berterame and colleagues.<sup>3</sup> However, opioid consumption in 2019–21 has only increased to an amount similar to the 2001–03 period after 20 years. Considering that cancer incidence and mortality have substantially increased, the stagnant opioid consumption in these periods suggests a worsening problem in which the availability of opioids for pain treatment is reduced.

Both morphine and oxycodone have shown an increasing trend during the past decade. South Africa is a major contributor to morphine and oxycodone SDDD throughout the analysed period because morphine and its alternatives are the most common opioid used for chronic non-cancer pain and cancer pain. Morphine is also included in South Africa’s standard treatment guidelines and essential medicines list.<sup>24</sup> Although oxycodone is included as a morphine alternative, it is not the first-line option due to its higher cost.<sup>24</sup>

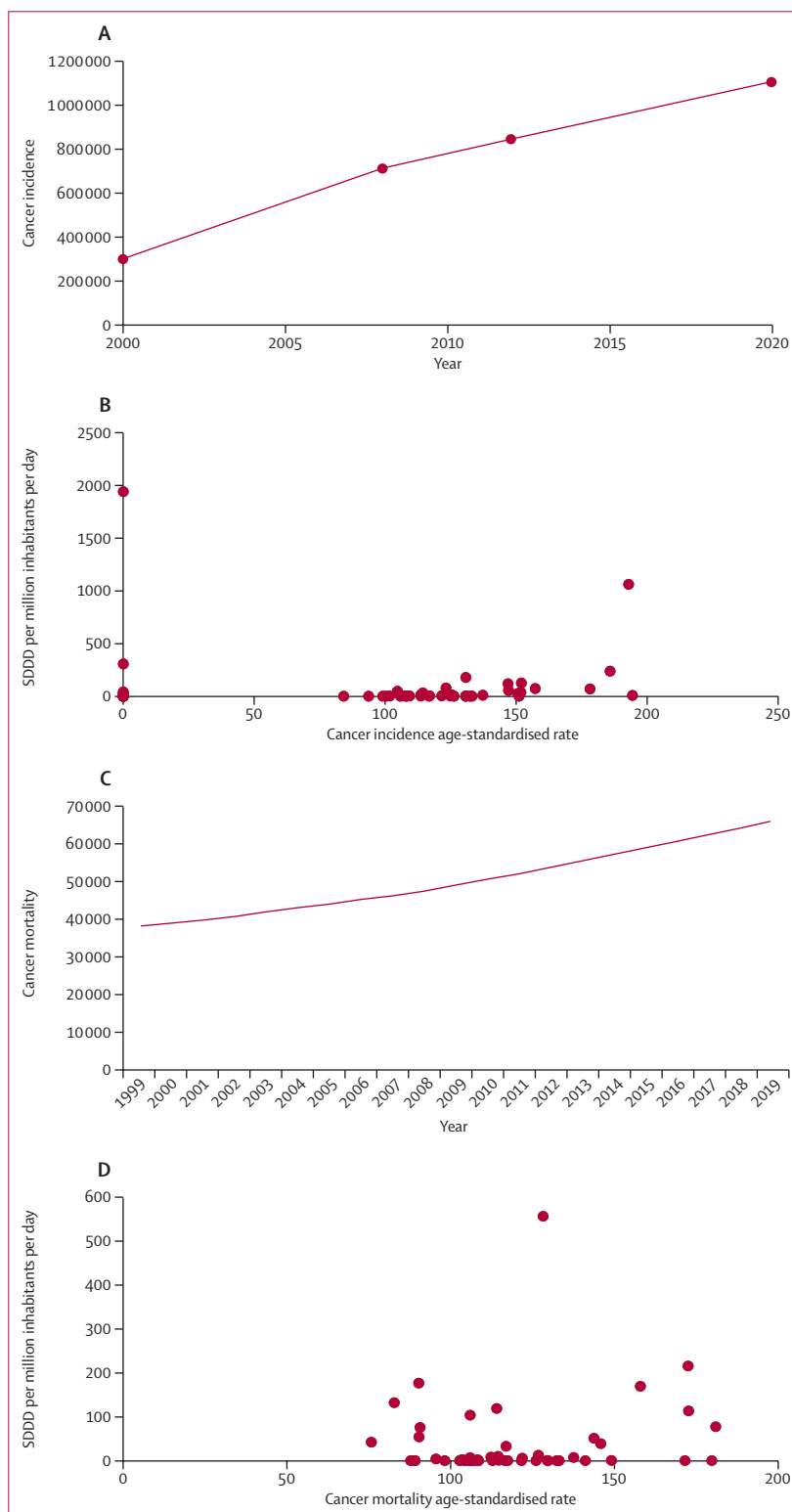
Next, insufficient resources and financial issues can pose a major obstacle to opioid accessibility.<sup>3,25</sup> Opioid prices can be inflated due to government regulation, licensing, taxation, and inadequate distribution systems. For example, oral solid immediate-release morphine tablets are reported to be 5·8 times more expensive in lower-middle-income countries compared with high-income countries.<sup>25</sup> Moreover, the accessibility and affordability of quality health care are also determined by the country’s income level.<sup>15</sup> Indeed, we observe a proportional increase in opioid consumption along with the income levels. For example, Mauritius, Seychelles, and South Africa have a high opioid consumption within the continent due to their higher income levels. Despite

being a lower-middle-income country, Tunisia has a higher opioid consumption than all upper-middle-income countries except Mauritius and South Africa. This discrepancy is due to Tunisia's strong historical political commitment towards establishing a palliative care system, including organisations such as the Tunisian Association for the Fight against Cancer and the Tunisian Association of Palliative Care (Association Tunisienne de Soins Palliatifs in French).<sup>26</sup> Hence, policy changes to adopt these measures in other countries should be encouraged to ameliorate their existing circumstances, and further studies should also be focused on documenting the effect of such measures on the overall consumption trend.

Despite a huge rise in cancer incidence and mortality, opioid consumption in Africa has remained stagnant for the past two decades. This finding suggests that the availability of opioid analgesics in Africa is still insufficient to cater to the needs of patients receiving cancer pain treatment, probably resulting in unmanaged moderate-to-severe pain in many cancer patients during their treatment and end of life. Because cancer incidence is projected to double from 2020 to 2040 and reach 2·1 million, the stagnant opioid consumption level requires urgent attention to prevent the situation from becoming severe, potentially worsening the unmet needs for optimum cancer care.<sup>27</sup> Hence, there is an urgent need for country-level policies, programmes, resources, education, and training on palliative care to be in place to improve the overall situation.

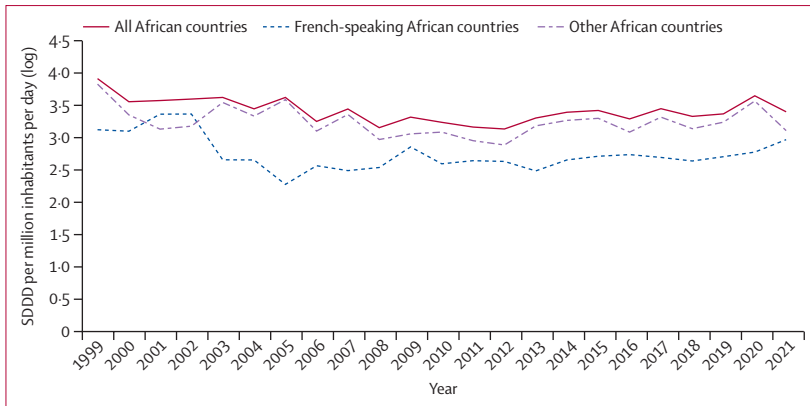
To further explore the potential barriers in opioid accessibility and consumption including sub-regional specificities, we analysed the data per language cluster with an emphasis on French-speaking countries. Previous studies have shown a higher disease burden and under-representation in international literature and research effort in French-speaking African countries.<sup>15,16</sup> Herein, we have shown that opioid consumption in French-speaking African countries was consistently lower than in their English-speaking counterparts. Considering that a substantial gap in opioid consumption remains between these groups, further research, such as a cross-cultural comparative analysis, is necessary to explore the underlying factors contributing to this disparity, including potential influences such as educational opportunities, language barriers affecting access to scientific resources,

potential post-colonial, cultural, and religious aspects, and other relevant factors. We recognise the significance of exploring this topic further, especially in French-



**Figure 4:** Sub-analysis of opioid SDDD based on cancer mortality in Africa

(A) Time trends in cancer incidence in Africa during the last 20 years. (B) Association between the cancer incidence age-standardised rate and consumption of opioid analgesics in Africa. (C) Time trends in cancer mortality in Africa during the last 20 years. (D) Association between the cancer mortality age-standardised rate and consumption of opioid analgesics in Africa. Cancer mortality and cancer mortality age-standardised rate data were retrieved from the Institute for Health Metrics and Evaluation, Global Burden of Disease. Opioid consumption data were provided by the International Narcotics Control Board. SDDD=defined daily doses for statistical purposes.



**Figure 5: Sub-analysis of opioid SDDD based on the language spoken in Africa**

A total of 57 African countries are in the All African countries category. There are 24 French-speaking African countries, including 21 Francophone countries and three additional African countries (Algeria, Morocco, and Tunisia) that comprise a large French-speaking population. Other African countries are the remaining 36 African countries that are not part of the French-speaking African countries. Data were obtained from the International Narcotics Control Board. SDDD=defined daily doses for statistical purposes.

speaking African countries, and we have considered it as the next crucial step in our research endeavours.<sup>28</sup>

It has previously been reported that the impediments to opioid availability and accessibility might be attributed to several aspects, such as the shortage of training or awareness in medical professionals, fear of addiction, poor financial resources and difficulty in sourcing, and cultural and social attitudes among health professionals and patients such as the fear of creating opioid dependence.<sup>25</sup> To tackle these limitations, Afrocentric education tools around palliative care should be emphasised through concerted campaigns to improve health literacy and correct the misconceptions about opioids.<sup>29</sup> Research programmes to analyse the unwillingness to use opioids for pain management specifically in African contexts should also be established through interdisciplinary collaboration with other fields such as sociology.

Conversely, several studies have highlighted the negative attitudes and fear in patients being given opioids for treatment.<sup>30</sup> Some of the stereotypical reasons for the reluctance to use opioids include the fear of drug dependency or the implication that the use of opioids marks the end of life.<sup>30</sup> Hence, more educational programmes and awareness-raising workshops such as seminars, special training, or working groups that foster responsible prescribing practices among health-care professionals and that address the misconceptions regarding opioid analgesics and pain management within the patient community should be emphasised. Government policies and regulations must also be revised to prevent over-restricted access to prescription forms and other restrictions in opioid prescriptions. For example, workshops organised by WHO palliative care projects, together with the African Palliative Care Association, have discussed policies for opioid availability and developed advocacy action plans to facilitate opioid accessibility and

availability.<sup>22</sup> Hence, more collaborative workshops should be organised for safe and better pain management.

Despite our efforts in delineating the African data for the past two decades, there are limitations to our study. The INCB data do not differentiate between the use of opioids for different indications, and such data are also not available in any other source. Despite tramadol being widely used in both acute and chronic pain treatment and having been included in the essential and generic medicines list of many African countries, it is currently not under international control and, hence, is not reported by the INCB. Moreover, the board also mentioned that most of the need for methadone is related to opioid substitution therapy instead of pain management. Due to these reasons, the INCB does not include tramadol and methadone in its data for substances used in pain management, and we have followed the methods and reporting guidelines by the INCB to exclude these substances from our study.<sup>6</sup> It should also be noted that we are only making a reasonable extrapolation to assess the availability of opioids for cancer pain and attempt to correlate opioid consumption with cancer incidence and mortality to show the insufficient need. Further, there is existing uncertainty in the consumption estimates due to imprecise population estimates, particularly in low-income countries, or if there are stockpiled or unused opioid medications. However, the regular reporting of stock-on-hand to the INCB and annual estimates of need shall help mitigate the potential effect of these issues. It should be noted that there is no objective standard for determining an adequate amount of opioid consumption, especially when it is challenging to precisely assess the estimation of disease burden and the need for pain relief. The actual extent of opioid use could be much lower than what is needed, and it might be appropriate to set even higher targets to improve further. Our reporting of low use serves merely as a guidance, and countries should not be restricted if higher consumption of opioid use are necessary. Challenges include an absence in measurement standards for opioid consumption, and data on disease burden and pain relief needs in low-income countries such as in Africa and south Asia.

To our knowledge, for the first time, in this study, we have shown that opioid consumption in African countries has been stagnant at an extremely low and potentially inadequate level during the last two decades. Furthermore, we have shown that in a continent that has little opioid access and use while cancer incidence and mortality has dramatically increased, there are further disparities between sub-regions with different income levels and languages spoken. Hence, there is an urgent need for more specific research to further explore such disparities and their potential cultural, economic, and political context to design more tailored solutions to overcome the impediments and facilitate progress towards better availability and use of opioids, especially in cancer care and end-of-life care.



### Contributors

YH and SP conceived and designed the study. YH and JT obtained the data from the Narcotics Control and Estimates Section of the INCB, and the data were analysed and verified by all authors. YH drafted the report and all authors critically revised it. All authors read and approved the final version of this manuscript, and had final responsibility for the decision to submit for publication.

### Equitable partnership declaration

The authors of this paper have submitted an equitable partnership declaration (appendix 3). This statement allows researchers to describe how their work engages with researchers, communities, and environments in the countries of study. This statement is part of *The Lancet Global Health's* broader goal to decolonise global health.

### Declaration of interests

We declare no competing interests.

### Data sharing

All the raw data and the analysed SDDD data are fully available upon request from the corresponding author.

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