Availability of Morphine and Pethidine in the World and Africa

With a special focus on:

Botswana, Ethiopia, Kenya, Malawi, Nigeria, Rwanda, Tanzania, Zambia

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I. ABOUT THE PAIN & POLICY STUDIES GROUP

The Pain & Policy Studies Group (PPSG) mission is to promote "balance" in international, national and state pain policies to ensure adequate availability of opioid analgesics for the relief of pain and suffering and their appropriate medical use for patient care while addressing diversion and abuse. The PPSG is part of the University of Wisconsin Comprehensive Cancer Center within the School of Medicine and Public Health, and is designated the World Health Organization (WHO) Collaborating Center for Policy and Communications in Cancer Care. Much of the PPSG's work, including WHO Guidelines for achieving balanced national opioids control policies, are discussed later in this document, and are available on its website at www.medsch.wisc.edu/painpolicy. As a WHO Collaborating Center, the PPSG provides technical assistance to governments and NGO's in Africa, Asia, Europe, Latin America, and has established a WHO Demonstration Project in Calicut, India. The PPSG is developing a fellowship training program and an internet course on international pain policy.

The PPSG also supports a global communications program to improve access to information about pain relief, palliative care, and pain policy, and publishes a WHO newsletter *Cancer Pain Release* (http://www.medsch.wisc.edu/WHOcancerpain/).

In the USA, the PPSG supports a program of policy research, education and communications. This program includes: regular evaluation and grading of federal and state pain policies; model policy development; technical assistance; research and education of medical regulators; tracking trends in use and abuse of opioid analgesics and prescription monitoring programs; and a website with extensive pain policy resources including a full text data base of federal and state pain policies (www.medsch.wisc.edu/painpolicy).

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II. INTRODUCTION: INTERPRETING INFORMATION IN THIS DOCUMENT

A. Why are opioid consumption statistics important?

In 1986, the World Health Organizaion (WHO) concluded that most pain due to cancer could be relieved using a simple analgesic method and that every national government should institute a cancer pain relief programme.[1] The WHO analgesic method has also been endorsed for relief of pain due to HIV/AIDS.[2] The method depends on the availability of, and patient access to, medicines that can relieve severe pain, such as morphine and other opioids. Recognizing that opioids are controlled strictly as narcotic drugs because of a potential for abuse and drug dependence, WHO recommended that governments (a) evaluate their drug control policies and practices to ensure that patients receive the opioid medications that are necessary for pain relief, and (b) encourage health care workers to report to the appropriate authorities any instance in which oral opioids are not available for cancer patients.

Indeed, the fact that opioids are narcotic drugs regulated by governments is why those interested in pain relief and palliative care for HIV/AIDS and cancer must learn about the drug regulatory system and prepare to work with governments.

More recently, the World Health Assembly and the United Nations Economic and Social Council have become concerned about inadequate patient access to pain relief and have adopted resolutions aimed at improving the availability of essential opioid medications for pain relief, especially in low and middle income countries.[3,4] The workshop on opioid availability for palliative care in Entebbe, Uganda in June 2006[5] is a major step in this direction.

Consumption statistics for opioids are one indicator of the capability of a country to treat moderate to severe pain. Morphine is frequently used as a principal indicator because morphine is the most widely available opioid analgesic for moderate to severe pain. Opioid consumption statistics can also be used to evaluate the outcomes of efforts to improve opioid availability. Consumption trends for pethidine are included in this monograph because, although pethidine is no longer recommended for chronic pain, it is still widely used. Other opioids such as tramadol and codeine are not included because they are not capable of relieving severe pain. Since pethidine and morphine are subject to the same legal controls, any country that uses pethidine should be able to use morphine.

B. Governments and the INCB are the source of opioid consumption statistics

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[1] World Health Organization. *Cancer pain relief*. Geneva, Switzerland: World Health Organization; 1986.
[2] World Health Organization. A community health approach to palliative care for HIV/AIDS and cancer patients in sub-Saharan Africa. Geneva, Switzerland: World Health Organization; 2004. http://www.who.int.cancer/palliative/report/en/print.html
[3] World Health Assembly. Cancer Prevention and Control. WHA 58.22 Geneva, Switzerland: World Health Organization; 2005. http://www.who.int/gb/ebwha/pdf_files/WHA58-REC1/english/A58_2005_REC1-en.pdf
[4] United Nations Economic and Social Council. Treatment of pain using opioid analgesics; Resolution 2005-25. Report on the forty-eighth session of the Commission on Narcotic Drugs E/2005/28; 19 March 2004 and 7-11 March 2005; issued 22 July 2005. 2005. http://www.who.int/gb/ebwha/pdf_files/WHA58-REC1/english/A58_2005_REC1-en.pdf
[5] African Palliative Care Association. *Advocacy for Palliative Care in Africa: A Focus on Essential Pain Medication Accessibility* to be held 27-29 June, 2006 in Entebbe, Uganda.

The International Narcotics Control Board (INCB) is the international narcotic regulatory authority for the United Nations; it monitors national governments' implementation of the 1961 Single Convention on Narcotic Drugs. This treaty, to which most governments are party, governs the cultivation, movement and availability of narcotic drugs for medical purposes in the world. According to the Single Convention, narcotic drugs are indipensible for the treatment of pain and suffering, and governments should ensure their adequate availability for all medial and scientific purposes, while preventing diversion and addiction. Governments must annually provide INCB an estimate of the amounts of opioids that will be required to satisfy all medical and scientific needs. Although INCB "confirms" the estimate as the amount authorized to be used in the country, the amount itself is determined by the government. Then INCB does not reduce governments' estimates to less than is needed. In fact, if unanticipated needs arise during the year, the INCB can confirm a supplemental request by a country in a week.

Governments also report opioid consumption statistics to the INCB which compiles them into annual statistical reports.[6] "Consumption" means the amounts distributed to the retail level in a country, i.e., to those institutions and programs that are licensed to dispense to patients. Consumption is reported by anhydrous weight of the active drug, not including the salt; for example, the amount reported for morphine does not include the weight of the salt (sulfate or chloride), just the morphine base. Some countries do not report consumption statistics. INCB publications do not report consumption of a drug less than 1 kilogram although PPSG obtains these data from the INCB and publishes them because there are many countries where small amounts are important and because any amount of morphine consumed demonstrates that the government approved its use.

C. Overview of consumption trends

Global Consumption

Graph 1. Global consumption trends for morphine and pethidine 1980 – 2004:

The consumption statistics in this monograph begin with the 'big picture' of the global trend for morphine and pethidine from 1980 to 2004 expressed in kilograms. Prior to 1986, the consumption of morphine throughout the world was low and stable. After 1986, the total global consumption of morphine began to increase as some national governments and health professionals adopted the WHO Analgesic Ladder and as new opioid products became available more widely. The consumption of pethidine exceeded that of morphine, but has slowly decreased as other opioids have become more widely used. Recently, there are indications that consumption of morphine is being offset in some countries by the advent of other opioid analgesics such as fentanyl, hydromorphone, methadone and oxycodone. Although some countries use morphine mainly for cancer pain, morphine may be used for other pain, including acute, post-operative, AIDS, and for chronic non-cancer conditions. In addition, some countries may use opioids including morphine and methadone for substitution treatment of drug dependence.

[6] International Narcotics Control Board. *Report of the International Narcotics Control Board for 2005*. New York, NY: United Nations; 2006. http://www.incb.org/en/annual_report_2005.html

Graphs 2 and 3. Global consumption of morphine and pethidine, 2004:
The next several graphs present consumption statistics in milligrams per capita (dividing the total amount of drug "consumed," in kilograms, by the population of the country) to provide a population-based statistic that will allow comparisons between countries and in relation to the global mean. The consumption of opioids varies greatly from country to country. Selected African countries that reported statistics are highlighted. The vast majority of morphine is consumed in industrialized countries which represent a small part of the world's population. The remaining countries of the world (a number of developed countries and all of the developing countries) consume comparatively little.

In a recent report, the INCB stated, "The low consumption of opioid analgesics for the treatment of moderate to severe pain, especially in developing countries, continues to be a matter of great concern to the Board. Global consumption of morphine increased significantly throughout the 1990s; in the past 20 years, it rose almost 10-fold, from 3 tons in 1984 to about 28 tons in 2003. However, the bulk of that increase occurred in some, but not all, developed countries, which represent a small part of the world's population. In 2003, six countries together accounted for 79 per cent of global consumption of morphine. Developing countries, which represent about 80 per cent of the world's population, accounted for only about 6 per cent of global consumption of morphine." (p. 25)[7]

Table 1 presents the data that appear in Graph 2 and table 2 presents the data for pethidine that appear in Graph 3.

African regional consumption of morphine and pethidine

Graph 4 presents a regional picture of morphine consumption in Africa, including the global and regional mean. Selected countries are highlighted. Pethidine statistics are provided for purposes of comparison in Graph 5.

Graphs 6 through 13 present morphine and pethidine consumption trends and data for 8 African countries expected to participate in the June 2006 workshop for which this monograph is prepared. These data are expressed in kilograms to enable the country team members to see exactly how much consumption was reported by their governments. Years for which there is no data means no report was received; for example, it appears that the INCB has not received a statistical report from the government of Malawi for several years.

D. Status of adherence to conventions, receipt of statistics and estimates

Table 3 presents information that the INCB compiles annually in an effort to inform the public about whether national governments are adhering to their obligations under the Single Convention. Information is provided for the 8 countries participating in the June 2006 workshop.

[7] International Narcotics Control Board. *Report of the International Narcotics Control Board for 2004*. New York, NY: United Nations; 2005. http://www.incb.org/en/annual_report_2004.html

From these data, it can be seen that all 8 governments are parties to the Single Convention, 1961, and as amended in 1972. Seven of the 8 countries submitted consumption statistics for 2004, however INCB did not receive reports on the amount of morphine consumed from the governments of Ethiopia or Nigeria. It appears that the INCB also did not receive any report from the government of Malawi and that the governments of Kenya and Malawi did not submit estimated requirements for 2006.

E. Comparison of estimates and consumption

Table 4 presents estimates and consumption for morphine from 1999 through 2004 for 8 African countries. Comparing a country's estimates with its consumption may be useful in raising questions about the reliability of estimates established by a country or its ability to obtain and consume the amounts that are estimated. Some countries estimate more than is consumed, as appears to be the case in Ethiopia. Such cases may indicate that the authorities are aware of the actual need for opioids but, for a number of reasons, the amounts that are needed are not acquired or distributed. On the other hand, Tanzania consumed more than estimated which may indicate that the estimate system may need improvement.

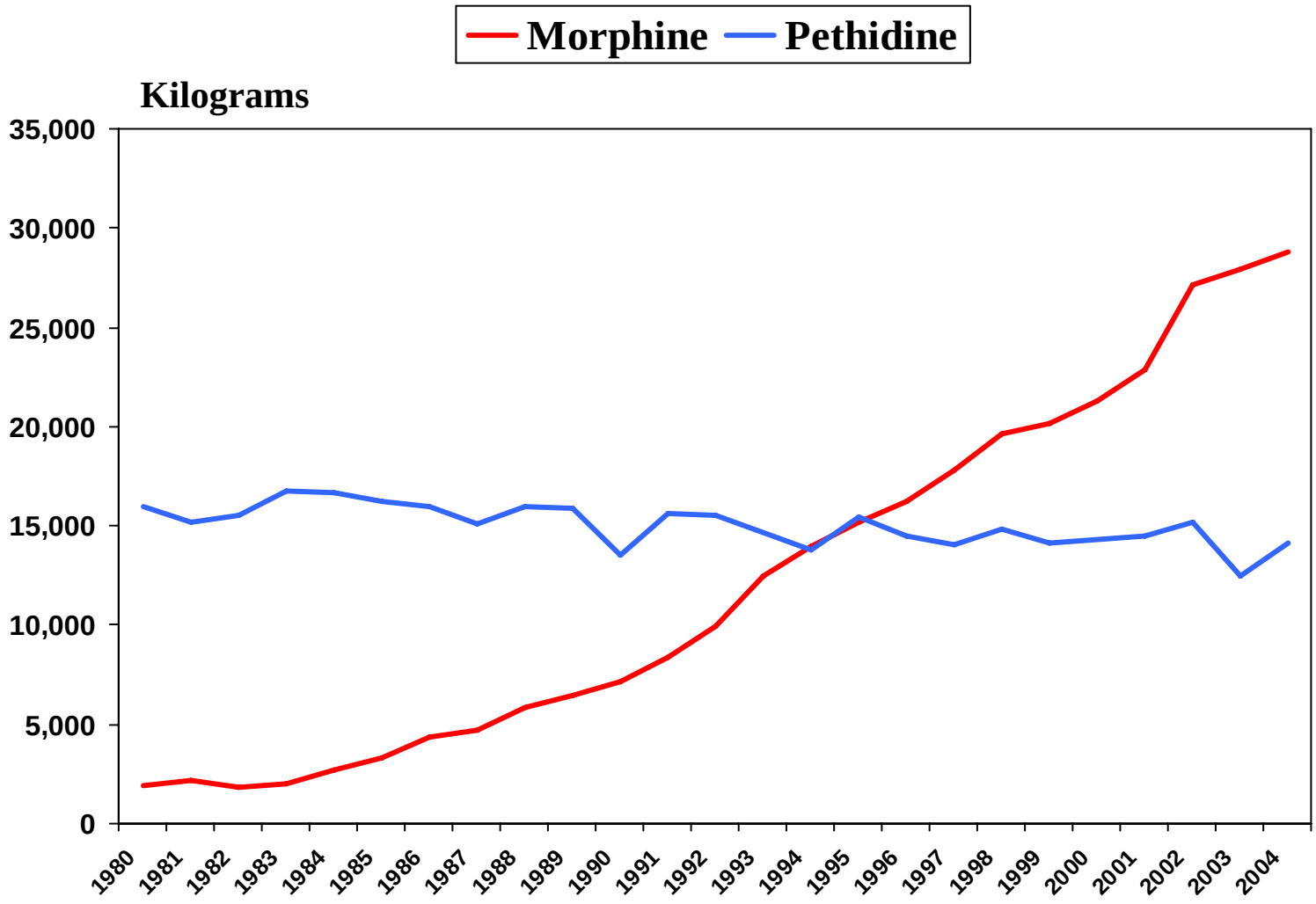
F. Competent national authorities

Each government that is party to the Single Convention designates an office which is responsible for carrying out required functions, including making estimates and reporting consumption statistics.[8] These offices may be located in the Ministry of Health in the pharmaceutical department or in the national food or drug control agency. These offices are the principal national authority for ensuring that opioid analgesics are adequately available for medical and scientific purposes and for submitting the required documents to the INCB. These offices receive reports from the INCB including (a) reports that are used in preparing this document, and (b) technical reports that encourage all governments to examine national policies and administrative procedures for barriers and to consult with health professionals in making up realistic estimates. However, sometimes these offices do not have adequate personnel to administer these and other important responsibilities in the area of drug control and availability.

[8] United Nations. *Competent national authorities under the international drug control treaties*, 2004. New York, NY: United Nations; 2005.

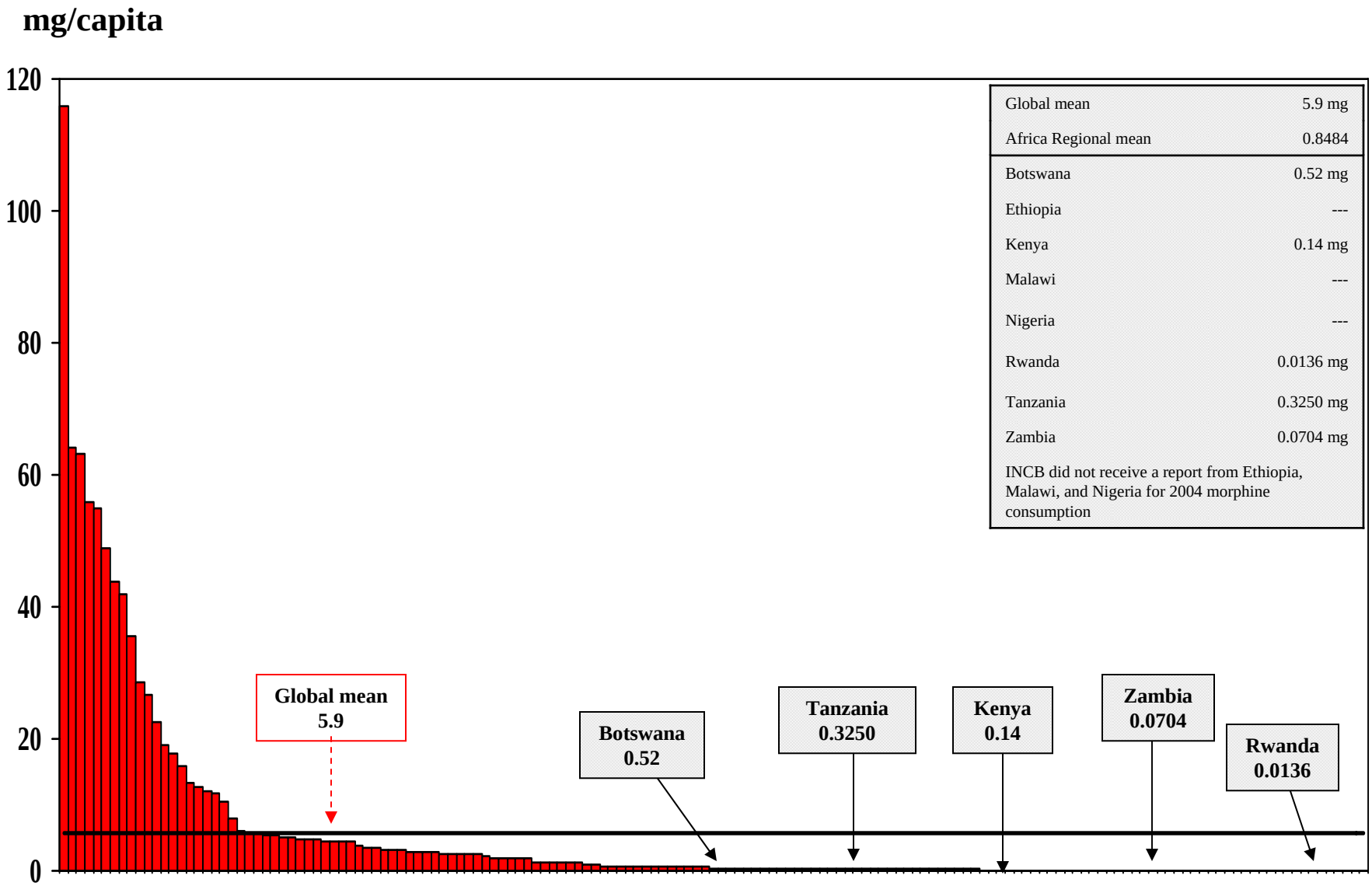
III. GLOBAL CONSUMPTION OF MORPHINE AND PETHIDINE

Graph 1. Global Consumption of Morphine & Pethidine 1980-2004



Source: International Narcotics Control Board
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

Graph 2. Global Consumption of Morphine, 2004



Source: International Narcotics Control Board
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

Table 1

Morphine Consumption: Africa* and the World (mg/capita)

Note: Countries not listed did not report morphine consumption to the INCB for 2004

1	Austria	115.7151	53	Rep. of Korea	2.0304	105	Mexico	0.1957
2	Canada	64.1751	54	Tunisia	1.9579	106	Azerbaijan	0.1810
3	Denmark	63.0390	55	Ukraine	1.8003	107	Turkey	0.1785
4	Australia	55.9482	56	Latvia	1.7505	108	Dominica	0.1714
5	New Zealand	54.8074	57	Bahamas	1.3943	109	Ecuador	0.1615
6	United States of America	48.8145	58	Jamaica	1.3806	110	Grenada	0.1584
7	Iceland	43.9204	59	Malaysia	1.3013	111	Mauritius	0.1521
8	France	41.8355	60	Macao	1.2809	112	Turkmenistan	0.1443
9	Norway	35.4423	61	Singapore	1.2174	113	Swaziland	0.1437
10	Sweden	28.4913	62	Lebanon	1.1213	114	**Kenya**	**0.1400**
11	Switzerland	26.5509	63	Argentina	1.0753	115	Wallis & Futuna Islands	0.1333
12	Falkland Islands	22.6667	64	Republic of Moldova	0.8212	116	Syrian Arab Republic	0.1244
13	United Kingdom	19.1548	65	Bahrain	0.7344	117	Vanuatu	0.1238
14	Netherlands	17.8260	66	Oman	0.7175	118	Chad	0.1197
15	Germany	16.0119	67	United Arab Emirates	0.7053	119	Colombia	0.1176
16	Saint Helena	13.2000	68	Panama	0.6261	120	Morocco	0.1153
17	Ireland	12.8478	69	Greece	0.6068	121	Kyrgyzstan	0.1111
18	Gibraltar	12.2069	70	Zimbabwe	0.5718	122	Viet Nam	0.0993
19	Spain	11.8115	71	Belarus	0.5606	123	Anguilla	0.0833
20	Belgium	10.4698	72	Mongolia	0.5511	124	Nauru	0.0833
21	Portugal	7.9790	73	Thailand	0.5421	125	Uzbekistan	0.0713
22	Poland	6.1887	74	Paraguay	0.5353	126	**Zambia**	**0.0704**
23	Czech Republic	5.7657	75	**Botswana**	**0.5200**	127	Mali	0.0665
24	New Caledonia	5.6591	76	Brunei Darussalam	0.5200	128	Egypt	0.0588
25	Finland	5.4013	77	Jordan	0.4981	129	Algeria	0.0546
26	Italy	5.3206	78	Dominican republic	0.4752	130	Libyan Arab Jamahiriya	0.0527
27	Israel	5.0158	79	Kazakhstan	0.4727	131	Marshall Islands	0.0526
28	Bulgaria	4.9697	80	Micronesia (Fed. States of)	0.4500	132	Bolivia	0.0524
29	French Polynesia	4.9069	81	Saudi Arabia	0.4463	133	Bhutan	0.0461
30	Japan	4.7174	82	Bosnia & Herzegovina	0.4332	134	Guatemala	0.0333
31	South Africa	4.6682	83	Sri Lanka	0.4248	135	Myanmar	0.0327
32	Estonia	4.5458	84	Peru	0.4163	136	Cape Verde	0.0217
33	Form. Yug. Rep.of Macedonia	4.3582	85	Uganda	0.4001	137	Indonesia	0.0180
34	Slovenia	4.3210	86	Cook Islands	0.3889	138	Senegal	0.0157
35	Slovakia	4.3185	87	Tonga	0.3861	139	**Rwanda**	**0.0136**
36	Barbados	3.8044	88	Republic of Palau	0.3500	140	Nepal	0.0126
37	Hong Kong SAR	3.4817	89	Qatar	0.3380	141	Benin	0.0112
38	Uruguay	3.3350	90	Kuwait	0.3376	142	Yemen	0.0100
39	Malta	3.2581	91	Montserrat	0.3333	143	Cambodia	0.0098
40	Costa Rica	3.2375	92	Nicaragua	0.3280	144	Burundi	0.0080
41	Brazil	3.0848	93	Iran (Islamic Republic of)	0.3277	145	Cameroon	0.0076
42	Andorra	3.0000	94	**United Republic of Tanzania**	**0.3250**	146	Sao Tome & Principe	0.0065
43	Namibia	2.8653	95	China	0.3221	147	Central African Republic	0.0048
44	Georgia	2.7498	96	British Virgin Islands	0.3182	148	Côte d'Ivoire	0.0032
45	Cyprus	2.7115	97	Saint Vincent & the Grenadines	0.2963	149	Dem. Rep. of the Congo	0.0031
46	Seychelles	2.6627	98	Venezuela	0.2961	150	Sierra Leone	0.0028
47	Hungary	2.5857	99	Russian Federation	0.2807	151	Eritrea	0.0021
48	Lithuania	2.4867	100	Guinea-Bissau	0.2368	152	Burkina Faso	0.0016
49	Chile	2.4758	101	El Salvador	0.2303	153	Pakistan	0.0013
50	Romania	2.4616	102	Turks & Caicos Islands	0.2273	154	Guinea	0.0011
51	Serbia & Montenegro	2.0794	103	Suriname	0.2183	155	Mozambique	0.0006
52	Netherlands Antilles	2.0447	104	Philippines	0.2182			

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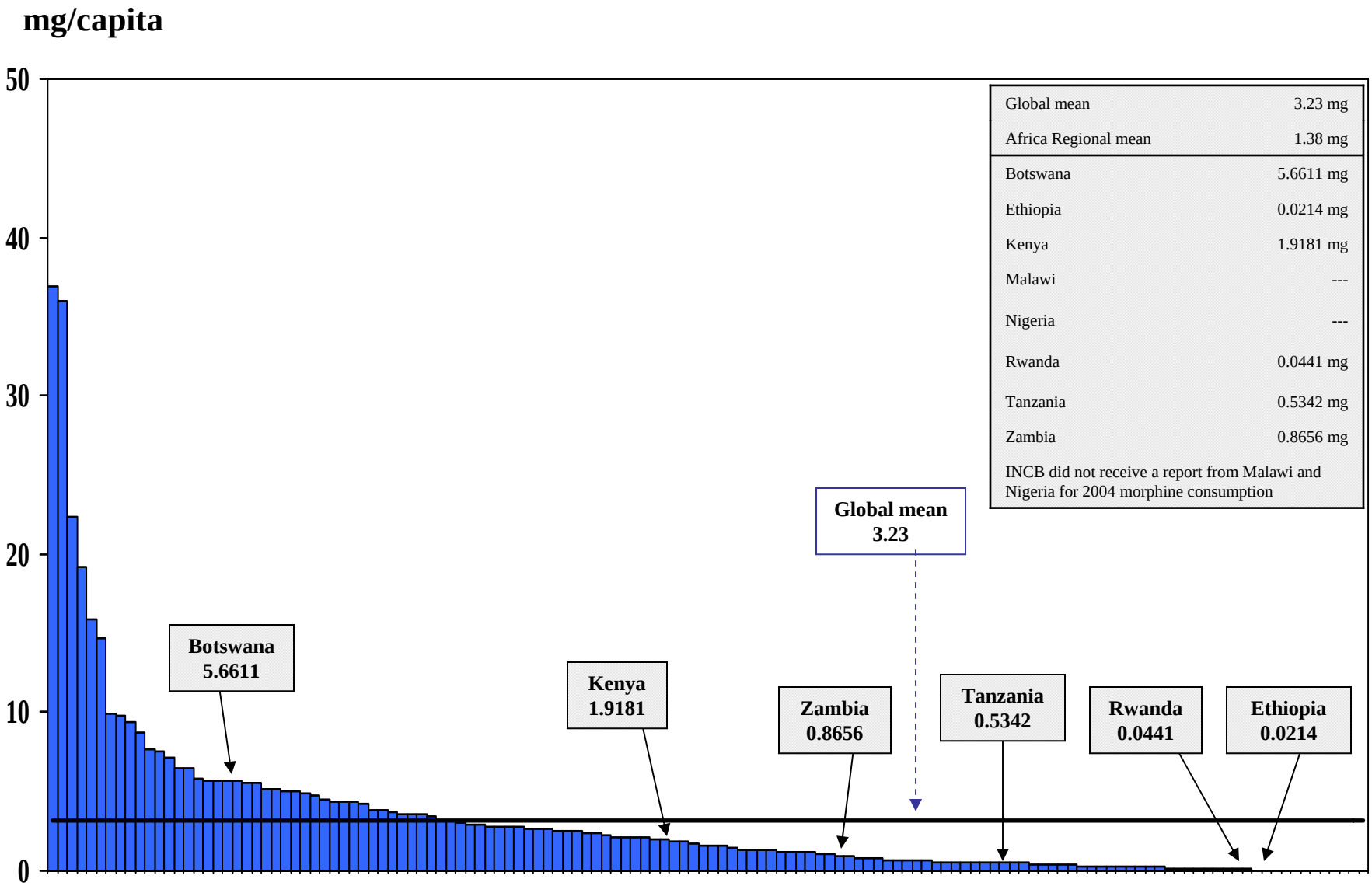
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"

Graph 3. Global Consumption of Pethidine, 2004



Source: International Narcotics Control Board
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

Table 2

Pethidine Consumption: Africa* and the World (mg/capita)

Note: Countries not listed did not report morphine consumption to the INCB for 2004

1	Canada	36.9578	46	Singapore	2.8373	91	Guatemala	0.6525
2	Barbados	35.9336	47	Seychelles	2.7831	92	Bhutan	0.5852
3	Montserrat	22.3333	48	Tonga	2.7426	93	El Salvador	0.5845
4	United States of America	19.1475	49	Hong Kong SAR	2.7123	94	Bangladesh	0.5679
5	Bahamas	15.8580	50	Lebanon	2.6794	95	Sweden	0.5635
6	Denmark	14.7015	51	Slovakia	2.6704	96	Colombia	0.5480
7	Switzerland	9.9508	52	Greece	2.6352	97	Italy	0.5476
8	Republic of Palau	9.8500	53	China	2.5775	98	Costa Rica	0.5378
9	Australia	9.4328	54	Brunei Darussalam	2.5457	99	**United Republic of Tanzania**	**0.5342**
10	Cook Islands	8.7778	55	Republic of Korea	2.5415	100	Venezuela	0.5174
11	Bahrain	7.7068	56	Germany	2.4337	101	France	0.4655
12	Czech Republic	7.5444	57	Bulgaria	2.4145	102	Tunisia	0.4278
13	Gibraltar*	7.1724	58	Uruguay	2.2842	103	Croatia	0.4115
14	British Virgin Islands	6.5000	59	Micronesia (Fed. States of)	2.1583	104	Viet Nam	0.3882
15	New Zealand	6.4976	60	Turkey	2.1430	105	Paraguay	0.3569
16	Cyprus	5.8585	61	Saudi Arabia	2.1031	106	Japan	0.3533
17	Jamaica	5.7141	62	Lithuania	2.0646	107	Cape Verde	0.3124
18	Turks and Caicos Islands	5.6818	63	Netherlands	2.0321	108	Yemen	0.2867
19	Dominica	5.6714	64	**Kenya**	**1.9181**	109	Nepal	0.2687
20	**Botswana**	**5.6611**	65	Iran (Islamic Republic of)	1.8502	110	Benin	0.2638
21	Mauritius	5.6190	66	United Kingdom	1.8232	111	Togo	0.2561
22	Malta	5.5138	67	Sri Lanka	1.7802	112	Vanuatu	0.2475
23	Norway	5.1544	68	Thailand	1.6470	113	Lao Peop. Dem. Rep.	0.2316
24	Grenada	5.1485	69	Swaziland	1.5624	114	Uganda	0.2272
25	Jordan	5.0572	70	Panama	1.5331	115	Argentina	0.2224
26	Ghana	4.9930	71	United Arab Emirates	1.4672	116	Bolivia	0.1891
27	Brazil	4.8826	72	Syrian Arab Republic	1.3836	117	Indonesia	0.1829
28	Netherlands Antilles	4.7263	73	Macao	1.3708	118	India	0.1270
29	Kuwait	4.4602	74	Nauru	1.3333	119	Dominican Republic	0.1248
30	Qatar	4.3811	75	Saint Vincent & the Grenadines	1.3333	120	Algeria	0.1108
31	Falkland Islands*	4.3333	76	Iceland	1.2422	121	Philippines	0.1100
32	Poland	4.3259	77	Austria	1.2333	122	Latvia	0.0972
33	Malaysia	4.2841	78	Portugal	1.2276	123	Eritrea	0.0886
34	Namibia	3.8311	79	Andorra	1.1857	124	Chad	0.0721
35	Israel	3.7794	80	Hungary	1.0703	125	Burundi	0.0566
36	South Africa	3.7694	81	Slovenia	1.0336	126	**Rwanda**	**0.0441**
37	Saint Helena*	3.6000	82	Finland	0.9858	127	Sao Tome and Principe	0.0392
38	Romania	3.5988	83	**Zambia**	**0.8656**	128	**Ethiopia**	**0.0214**
39	Ireland	3.5208	84	Serbia and Montenegro	0.8046	129	Myanmar	0.0190
40	Belgium	3.3875	85	Marshall Islands	0.7895	130	Sierra Leone	0.0180
41	Zimbabwe	3.2248	86	Albania	0.7547	131	Cambodia	0.0136
42	Spain	3.1166	87	Peru	0.7258	132	Dem. Rep. of the Congo	0.0130
43	Estonia	3.1041	88	Chile	0.7009	133	Gabon	0.0057
44	Libyan Arab Jamahiriya	2.9176	89	Oman	0.6974	134	Mozambique	0.0024
45	Anguilla	2.9167	90	Suriname	0.6570	135	Côte d'Ivoire	0.0017
						136	Guinea	0.0016

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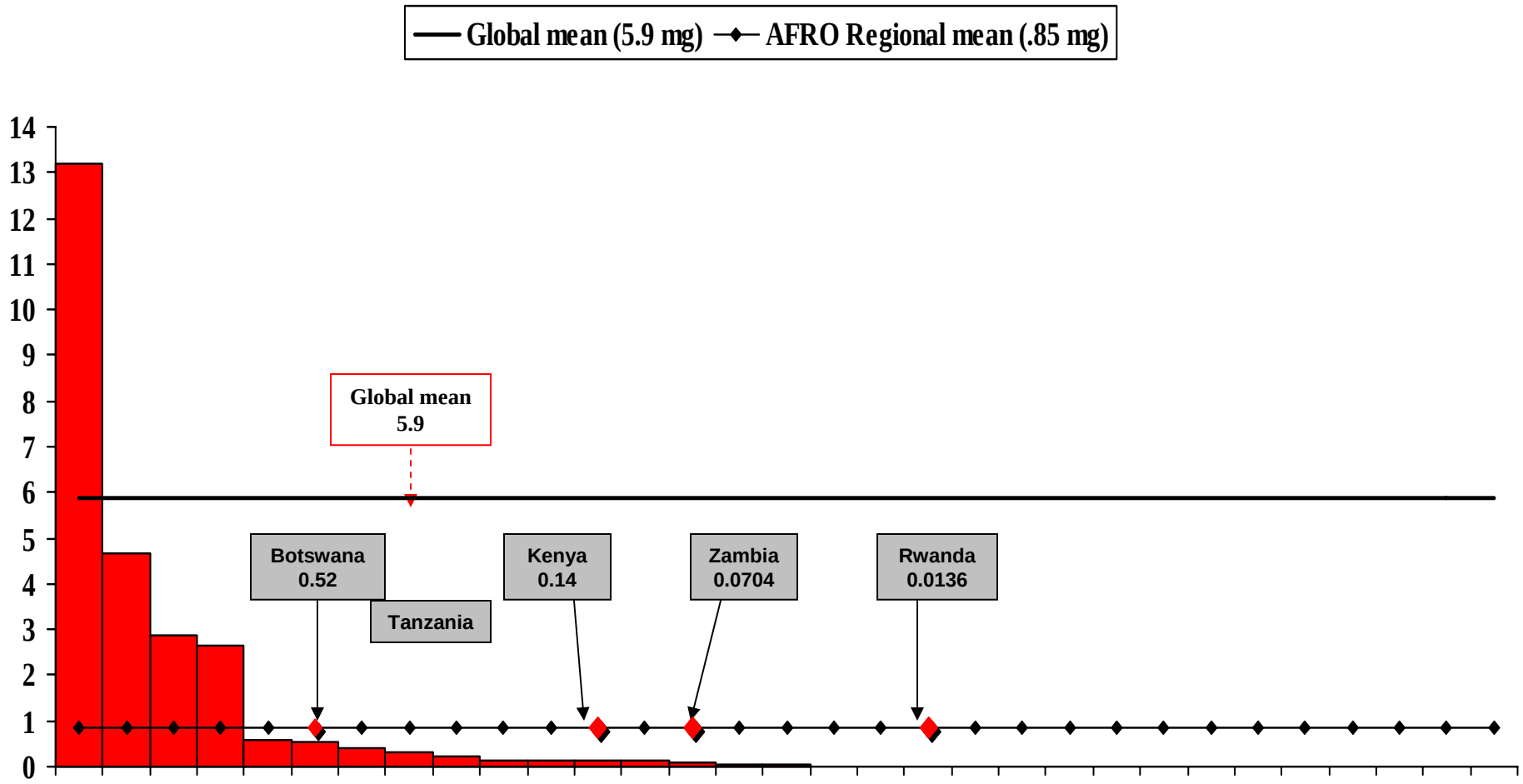
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"

IV. AFRICA REGIONAL CONSUMPTION OF MORPHINE AND PETHIDINE, 2004

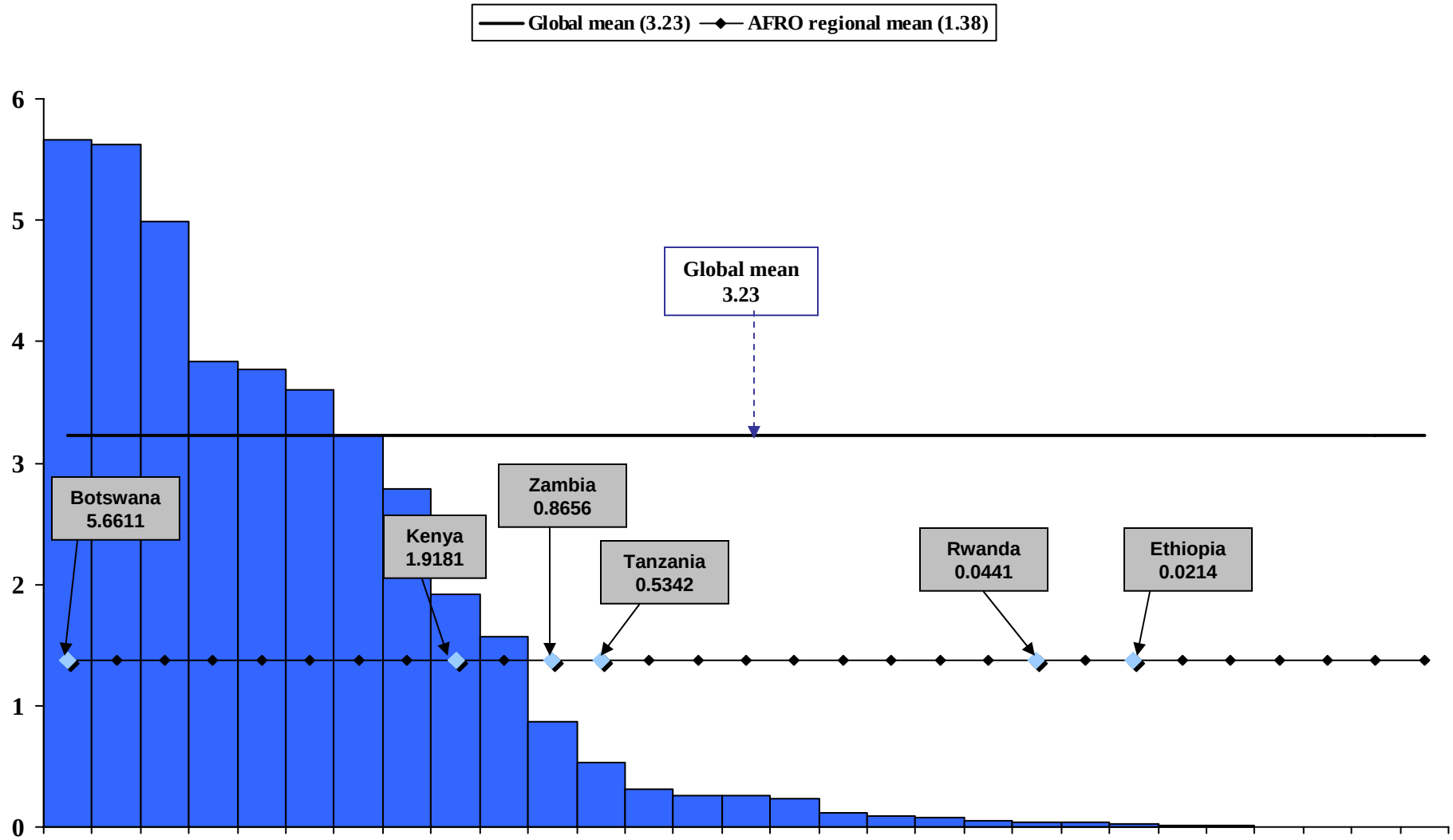
Graph 4. Consumption of Morphine, Africa, 2004 mg/capita



Source: International Narcotics Control Board; United Nations Demographic Yearbook
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

The means are calculated by adding the individual mg/capita statistics for all countries and then dividing by the number of countries; data does not Include information for countries from which the INCB did not receive a report

Graph 5. Consumption of Pethidine, Africa
2004 mg/capita

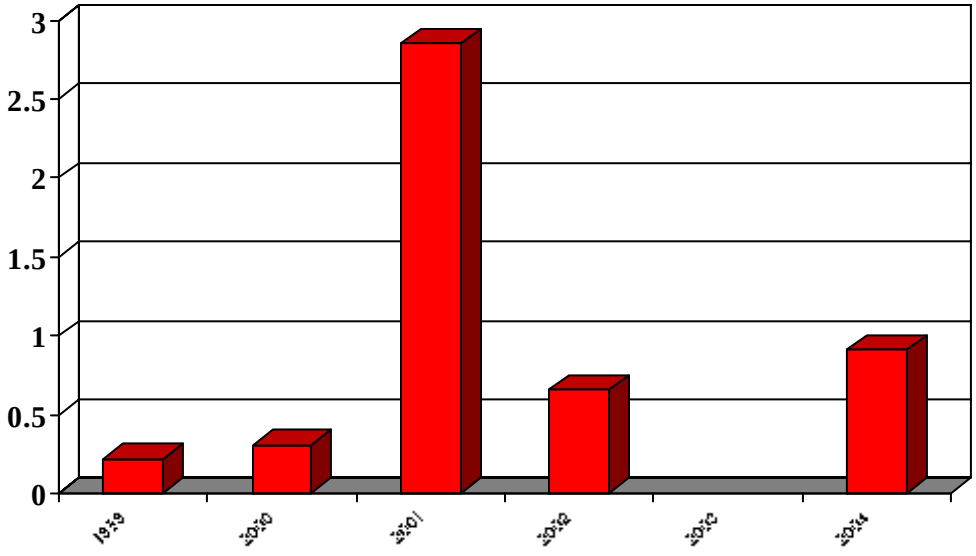


Source: International Narcotics Control Board; United Nations Demographic Yearbook
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

The means are calculated by adding the individual mg/capita statistics for all countries and then dividing by the number of countries; data does not Include information for countries from which the INCB did not receive a report

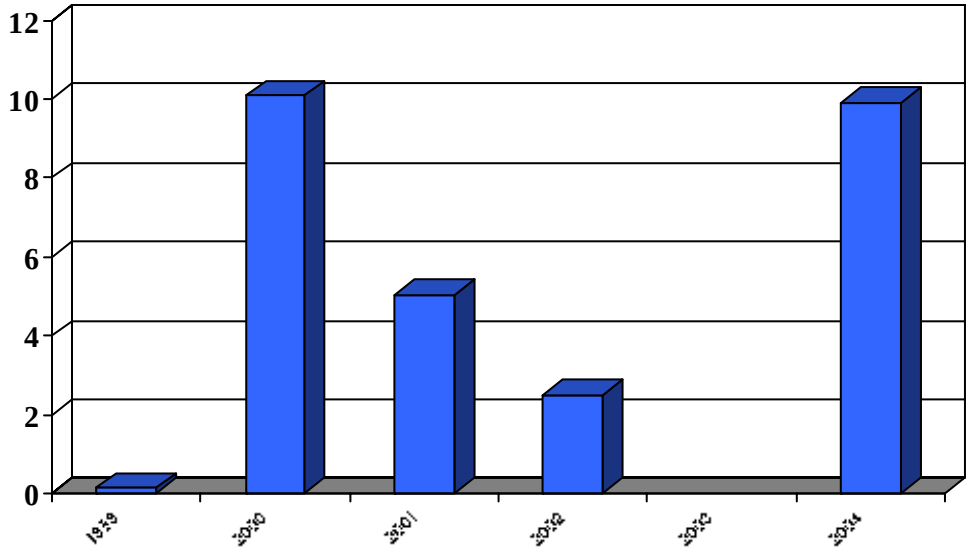
GRAPH 6. BOTSWANA

Morphine Consumption (Kg) 1999 - 2004



	1999	2000	2001	2002	2003	2004
Morphine	0.218	0.309	2.851	0.655	?	0.910

Pethidine Consumption (Kg) 1999 - 2004

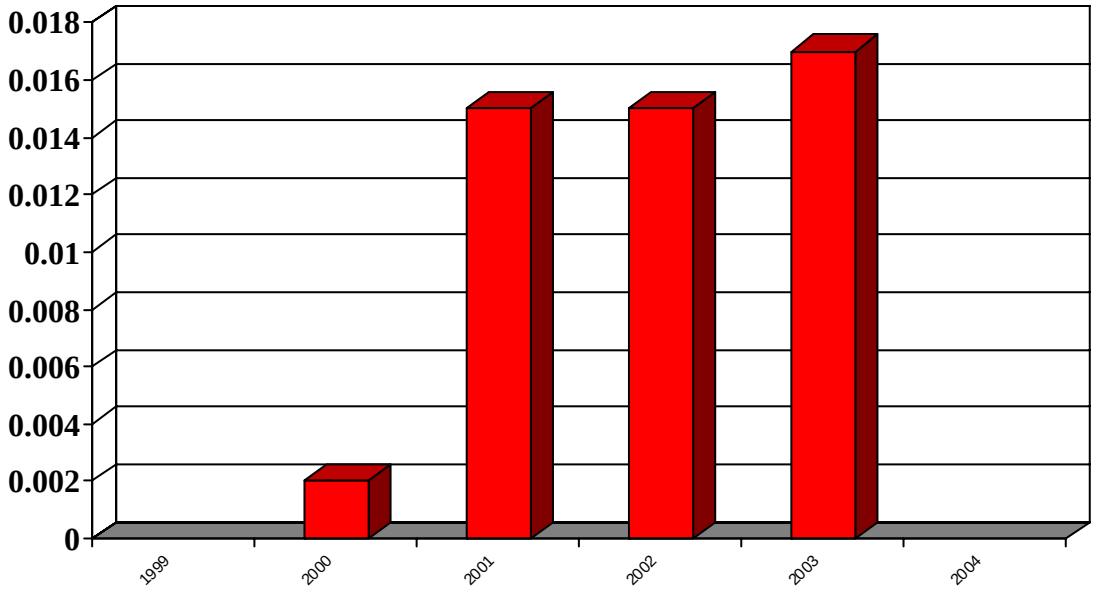


	1999	2000	2001	2002	2003	2004
Pethidine	0.138	10.089	5.027	2.495	?	9.907

'?' indicates consumption statistics were not received
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

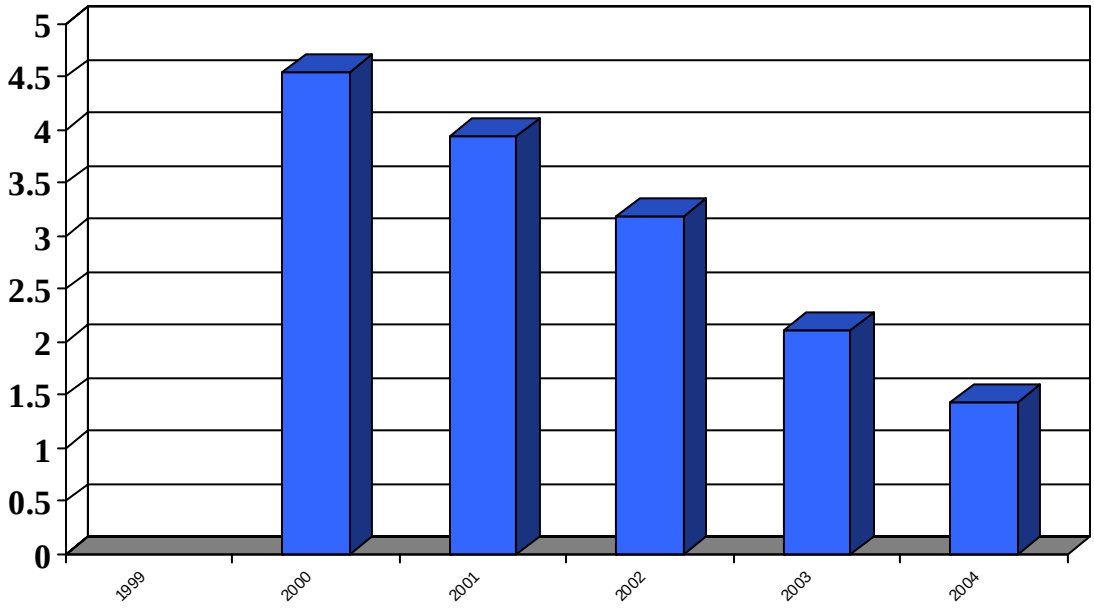
GRAPH 7. ETHIOPIA

Morphine Consumption (Kg) 1999 - 2004



	1999	2000	2001	2002	2003	2004
Morphine	?	0.002	0.015	0.015	0.017	?

Pethidine Consumption (Kg) 1999 - 2004

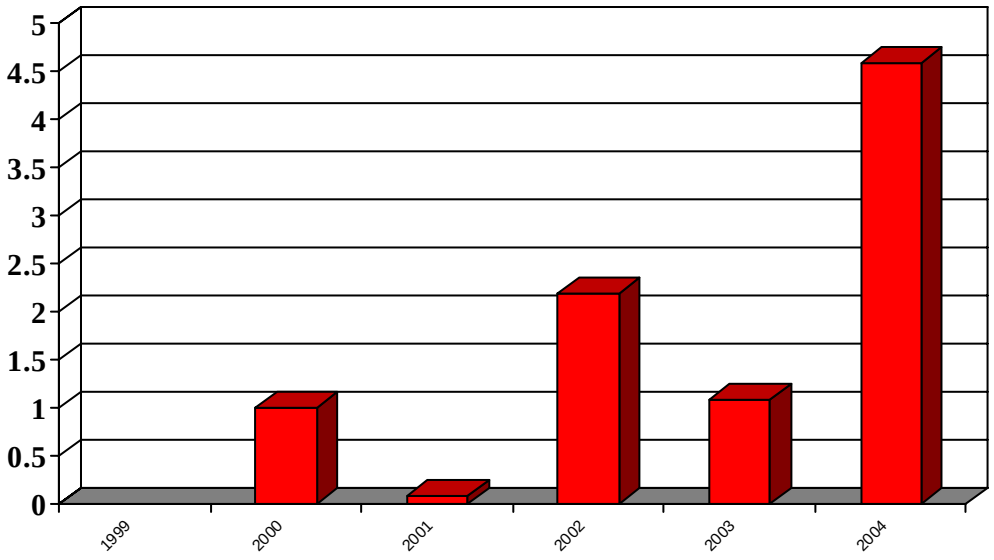


	1999	2000	2001	2002	2003	2004
Pethidine	?	4.546	3.939	3.185	2.117	1.440

'?' indicates consumption statistics were not received
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

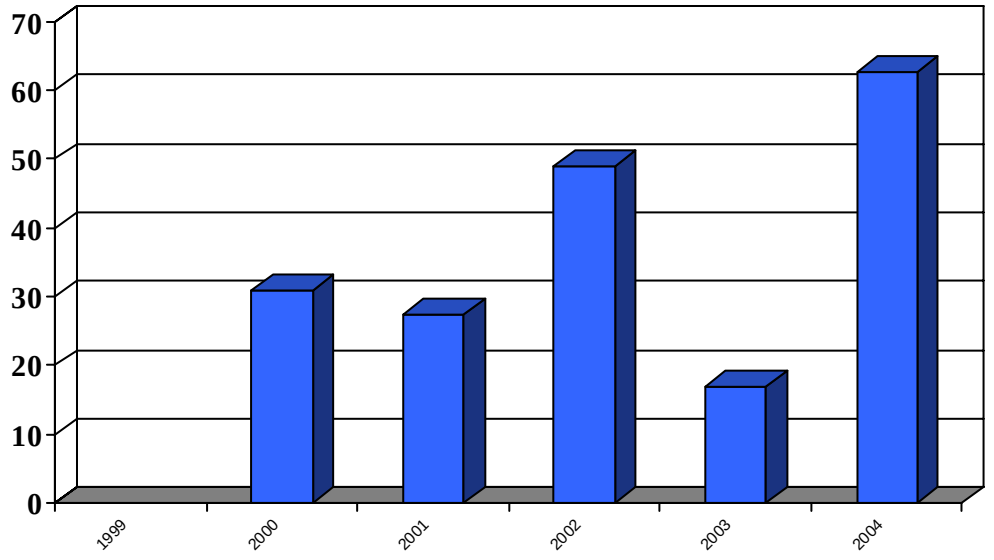
GRAPH 8. KENYA

Morphine Consumption (Kg) 1999 - 2004



	1999	2000	2001	2002	2003	2004
Morphine	?	1.000	0.090	2.192	1.084	4.578

Pethidine Consumption (Kg) 1999 - 2004

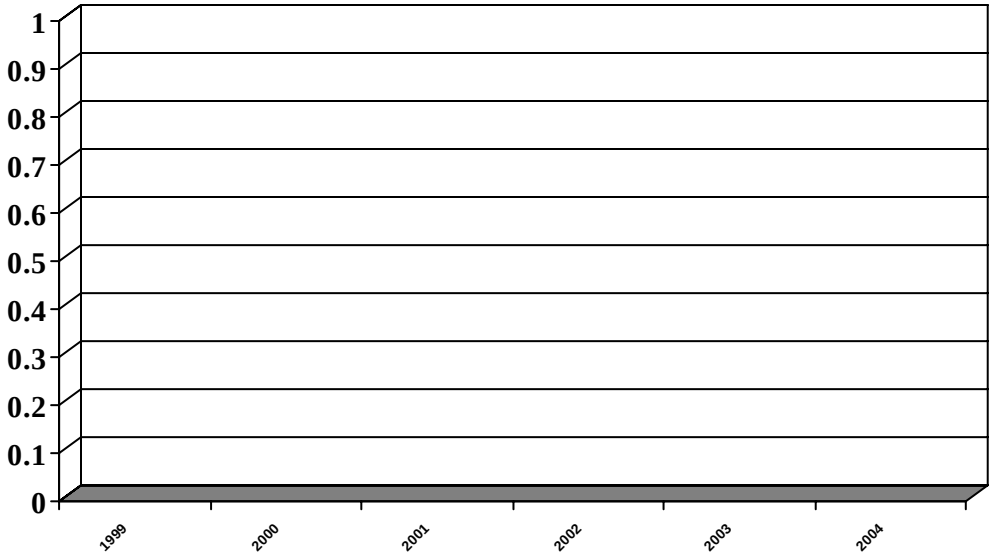


	1999	2000	2001	2002	2003	2004
Pethidine	?	31.000	27.428	48.969	16.932	62.705

'?' indicates consumption statistics were not received
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

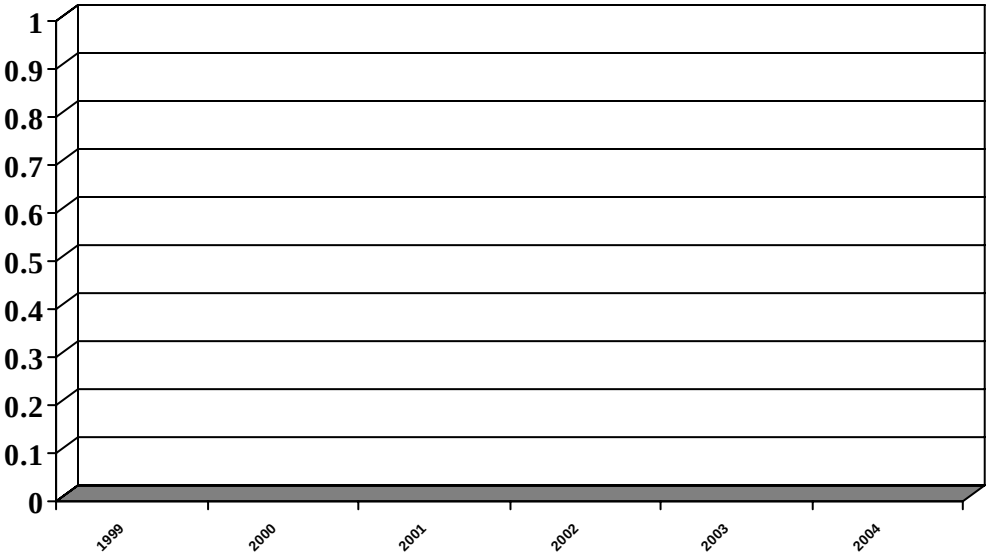
GRAPH 9. MALAWI

Morphine Consumption (Kg) 1999 - 2004



	1999	2000	2001	2002	2003	2004
Morphine	?	?	?	?	?	?

Pethidine Consumption (Kg) 1999 - 2004

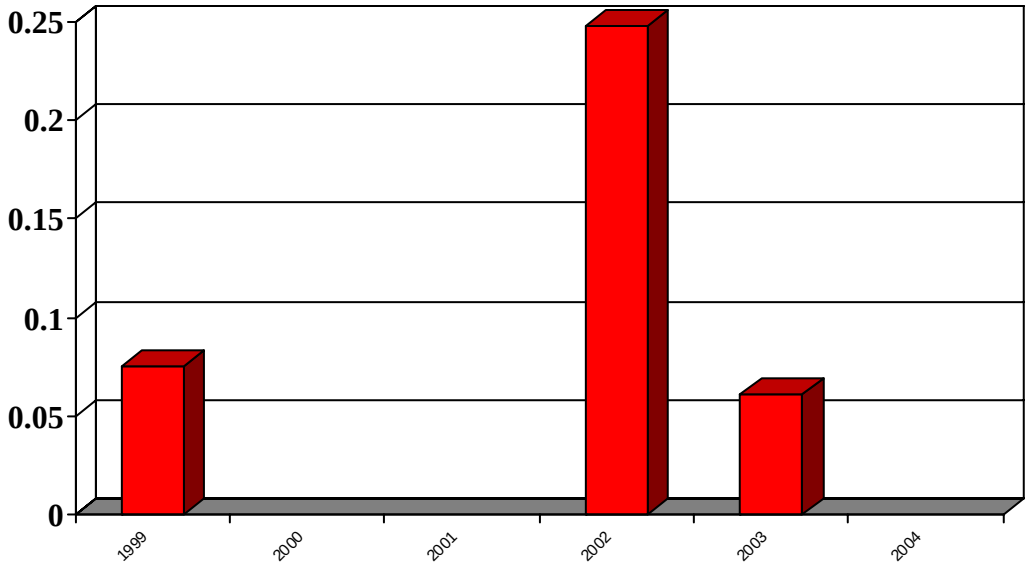


	1999	2000	2001	2002	2003	2004
Pethidine	?	?	?	?	?	?

'?' indicates consumption statistics were not received
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

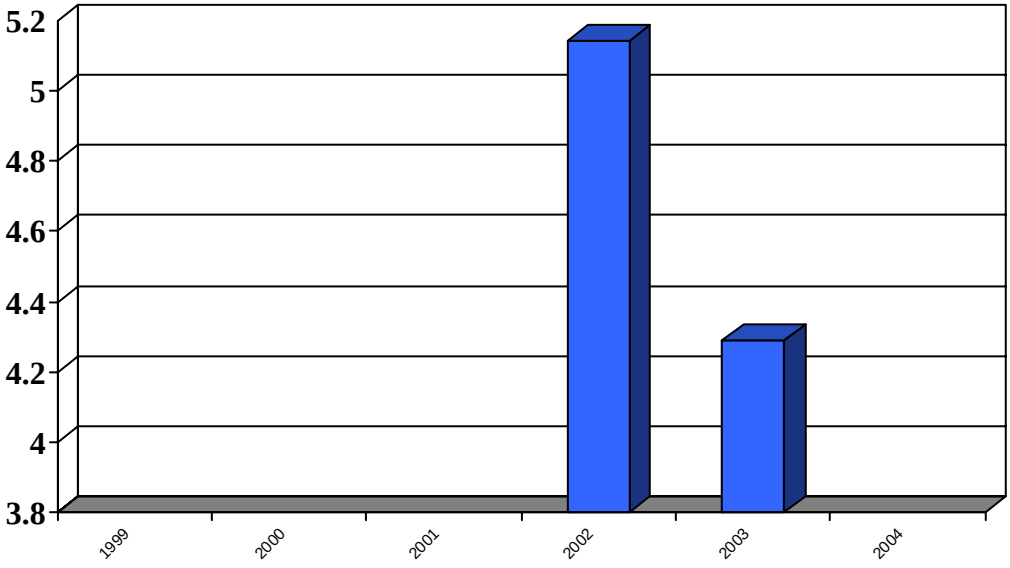
GRAPH 10. NIGERIA

Morphine Consumption (Kg) 1999 - 2004



	1999	2000	2001	2002	2003	2004
Morphine	0.075	?	?	0.248	0.061	?

Pethidine Consumption (Kg) 1999 - 2004

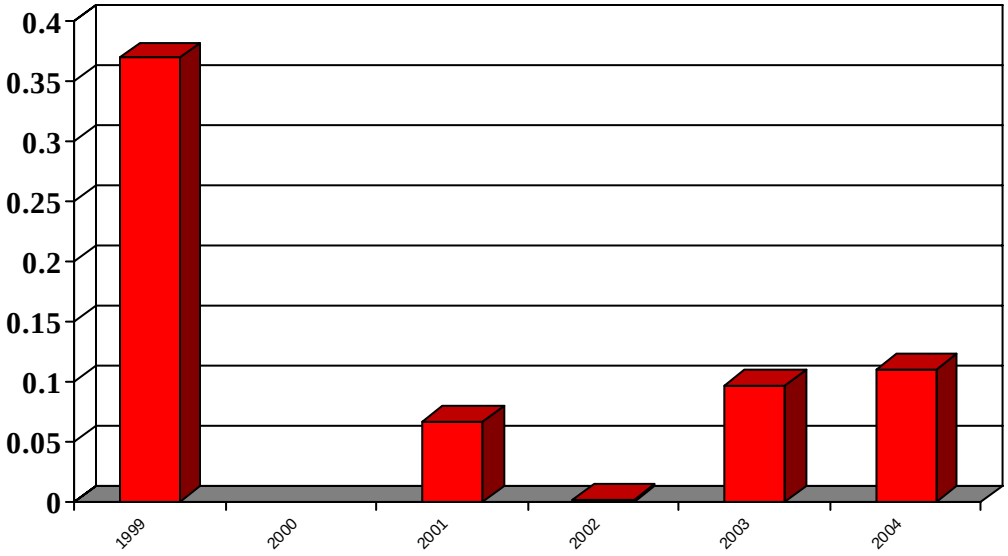


	1999	2000	2001	2002	2003	2004
Pethidine	?	?	?	5.142	4.292	

'?' indicates consumption statistics were not received
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

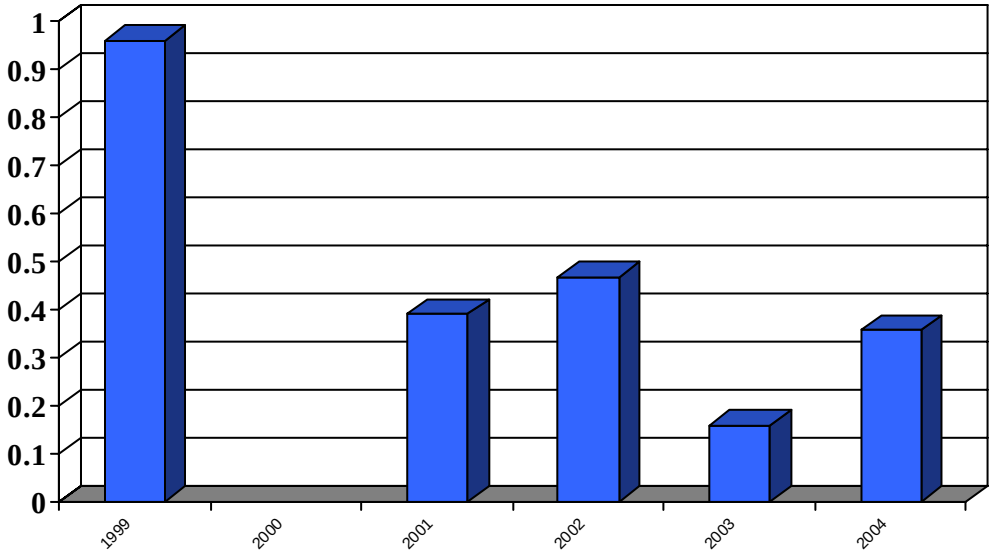
GRAPH 11. RWANDA

Morphine Consumption (Kg) 1999 - 2004



	1999	2000	2001	2002	2003	2004
Morphine	0.369	?	0.067	0.002	0.097	0.110

Pethidine Consumption (Kg) 1999 - 2004

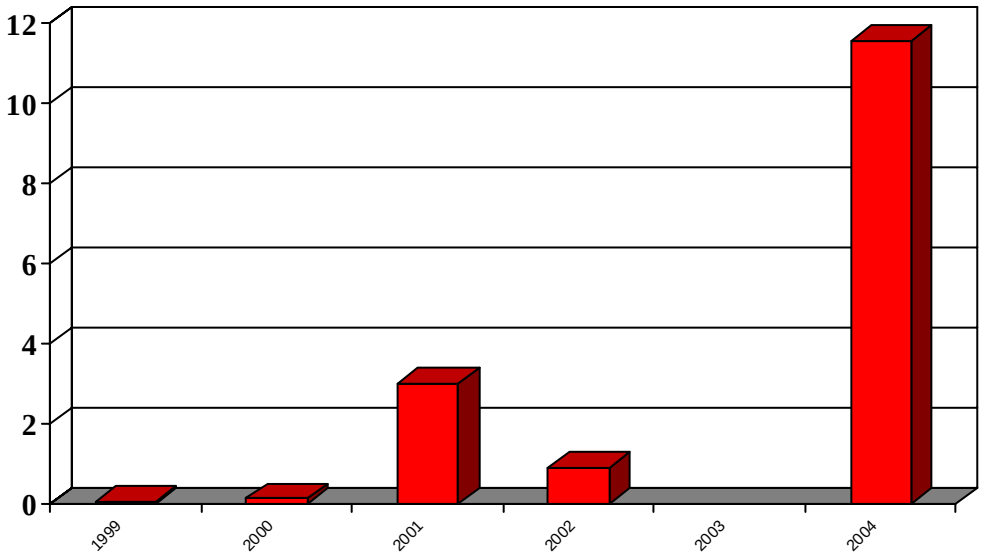


	1999	2000	2001	2002	2003	2004
Pethidine	0.959	?	0.390	0.467	0.157	0.356

'?' indicates consumption statistics were not received
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

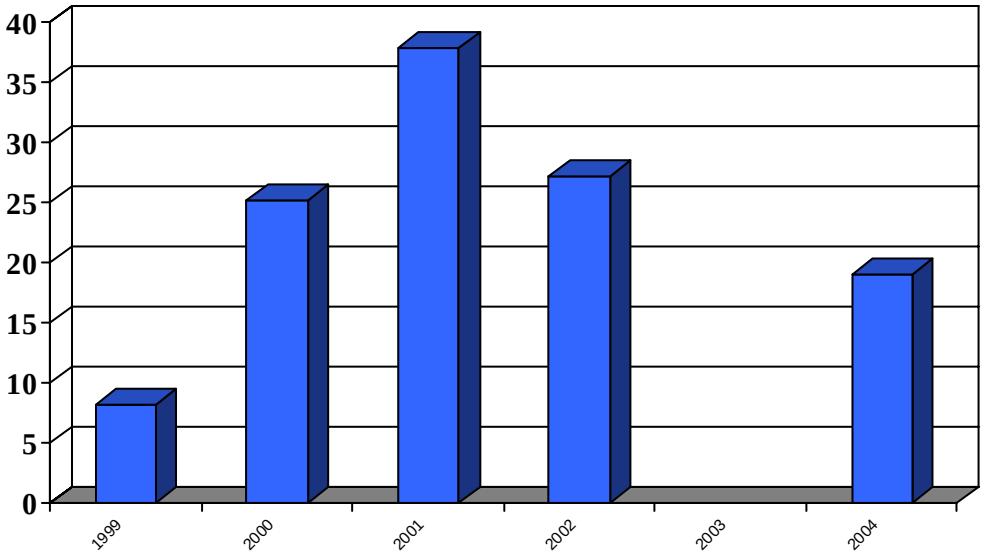
GRAPH 12. UNITED REPUBLIC OF TANZANIA

Morphine Consumption (Kg) 1999 - 2004



	1999	2000	2001	2002	2003	2004
Morphine	0.045	0.131	3.000	0.920	?	11.56

Pethidine Consumption (Kg) 1999 - 2004

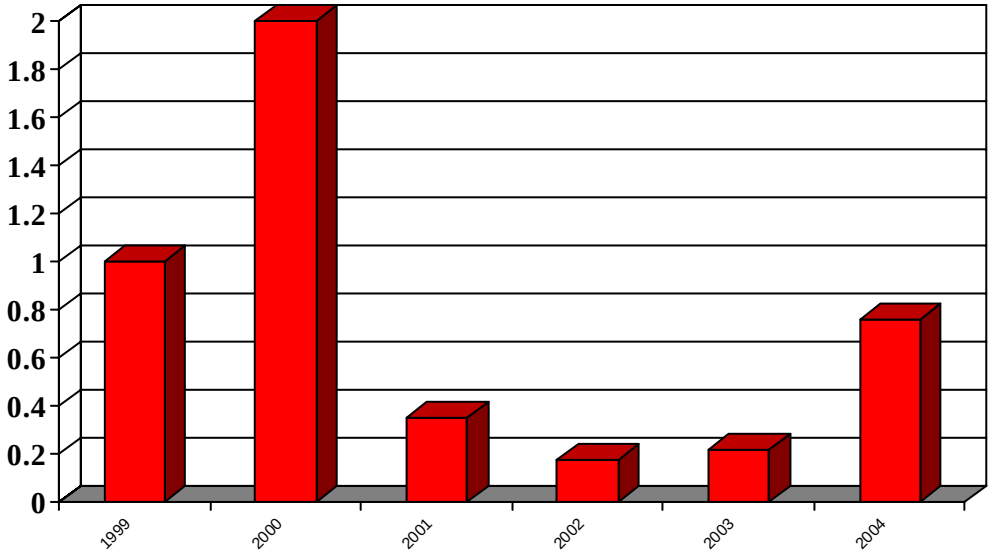


	1999	2000	2001	2002	2003	2004
Pethidine	8.200	25.113	37.831	27.119	?	19.00

'?' indicates consumption statistics were not received
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

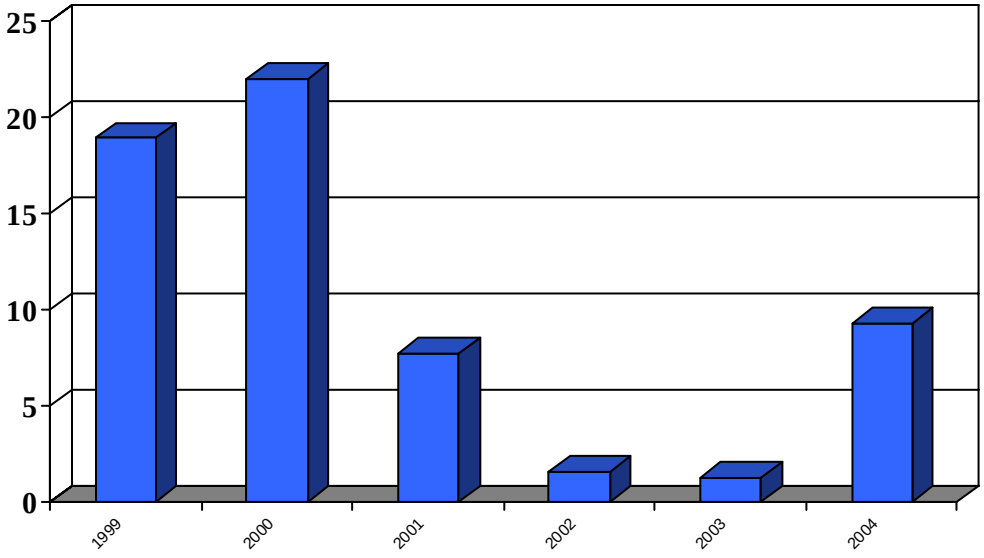
GRAPH 13. ZAMBIA

Morphine Consumption (Kg) 1999 - 2004



	1999	2000	2001	2002	2003	2004
Morphine	1.000	2.000	0.350	0.176	0.216	0.756

Pethidine Consumption (Kg) 1999 - 2004



	1999	2000	2001	2002	2003	2004
Pethidine	18.90	22.00	7.752	1.550	1.280	9.300

'?' indicates consumption statistics were not received
Source: International Narcotics Control Board; United Nations "Demographic Yearbook"
By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

VI. TABLE 3. STATUS OF ADHERENCE TO CONVENTIONS, RECEIPT OF STATISTICS, AND ESTIMATES

	Adherence			
	Single Convention 1961	As amended 1961/72	**Consumption Statistics for 2004**	**Estimated requirements for 2006**
Botswana	●	●	●	●
Ethiopia	●	●	*	●
Kenya	●	●	●	
Malawi	●	●		
Nigeria	●	●	*	●
Rwanda	●	●	●	●
Tanzania	●	●	●	●
Zambia	●	●	●	●

* Although consumption was reported, INCB did not receive information on *morphine* consumption for this country.

Source: International Narcotics Control Board, Narcotic Drugs, Estimated World Requirements for 2006, Statistics for 2004

By: Pain & Policy Studies Group, University of Wisconsin/WHO Collaborating Center, 2006

VII. TABLE 4. COMPARISON OF ESTIMATES AND CONSUMPTION FOR MORPHINE (REPORTED IN GRAMS)

	1999			2000			2001			2002			2003			2004		
	Est	**Cons.**	**%**	**Est.**	**Cons.**	**%**	**Est**	**Cons.**	**%**	**Est**	**Cons.**	**%**	**Est**	**Cons.**	**%**	**Est**	**Cons.**	**%**
Ethiopia 67,220,000	?	?	?	100	2	98%	1000	15	99%	1000	15	99%	1000	17	98%	1000	?	?
Kenya 32,692,000	?	?	?	10500	1000	90%	7875	90	99%	7875	2192	72%	15000	1084	93%	15000	4578	69%
Malawi 10,441,000	12000	?	?	9000	?	?	4500	?	?	4500	?	?	4500	?	?	4500	?	?
Rwanda 8,066,000	60	369	515%	60	?	?	400	67	83%	100	2	98%	110	97	12%	120	110	8%
Tanzania 35,565,000	5	45	800%	180	131	27%	10180	3000	71%	200	920	360%	200	?	?	200	11560	5680%
Zambia 10,744,000	1258	1000	21%	944	2000	112%	1450	350	76%	2500	176	93%	5000	216	96%	2000	756	62%

Note: The % column is the amount by which the estimate is either higher or lower with respect to the corresponding statistic. INCB states, "An estimate can usually be considered "good" if it shows a maximum deviation of approximately 15% from the corresponding statistic."

VIII. COMPETENT NATIONAL AUTHORITIES

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United Nations. *Competent national authorities under the international drug control treaties, 2004*. New York, NY: United Nations; 2005.