



Prevalence of Smokeless Tobacco Use and Number of Users in 121 Countries

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Authors' contributions

This work was carried out in collaboration between all authors. Author DNS conceptualized the paper, directed the analysis and wrote the first and final draft. Author NA did literature search, data management and data analysis. Author PCG provided inputs on review. All authors read and approved the final manuscript.

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ABSTRACT

Background: In 2010, a study estimated the number of smokeless tobacco (SLT) users in 70 countries at 302.4 million. These countries represented 70% of the global population. We aimed to update this information and widen the scope to estimate the global prevalence of SLT use by including a larger number of countries.

Methods: Data on the prevalence of current SLT use in 121 countries were obtained from various sources. Country-wise and gender-wise breakdown of the adult population in these countries was derived from the UN World Population for 2015. To translate prevalence rates into an estimate of the number of adult SLT users, we multiplied the adult male and female SLT prevalence rates by the corresponding male and female adult population in the respective countries. We then added the

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estimated number of male and female SLT users to get an overall estimate of SLT use.

Results: There were 352 million SLT users (351.9 million) in 121 countries. Of these, 67% were men (232.7 million) and 33% were women (119.2 million). Nearly 95% (333.1 million) of global SLT users lived in developing countries and only 5% (918.8 million) lived in developed countries; 82.7% of global SLT users lived in the World Health Organization (WHO) South-East Asia Region.

Globally, 90.4% of SLT users live in 11 countries of the world: India (237.4 million, 67.5%), Bangladesh (30.9 million), Myanmar (12.6 million), Pakistan (10.1 million), USA (9.6 million), China (4.1 million), Indonesia (3.2 million), Nepal (2.7 million), Madagascar (2.6 million), Germany and Uzbekistan (2.4 million each).

Conclusion: Smokeless tobacco use is a global epidemic affecting 121 countries. All 180 countries that have ratified the WHO Framework Convention on Tobacco Control (WHO FCTC) are obliged to monitor SLT use. Parties to the Convention should collect information periodically using standard protocols for national and international comparability. To prevent health and economic losses attributable to SLT use, countries, especially developing countries, should formulate strategies specific to SLT control.

Keywords: Chewing tobacco; oral tobacco; oral snuff; nasal snuff.

1. INTRODUCTION

In 2010, a study by the National Cancer Institute (NCI) and Centers for Disease Control and Prevention (CDC), USA estimated the number of smokeless tobacco (SLT) users in 70 countries at 302.4 million. These countries represented 70% of the global population [1]. We aimed to update information on the prevalence of SLT use as well as the number of SLT users in 121 countries that contain nearly 90% of the global population in 2015.

2. METHODS

We obtained data on the prevalence of SLT use from 122 countries from various sources [1–10] (Web Table 1). To estimate the number of SLT users, we used the current prevalence of SLT use from 118 countries, and the prevalence of daily SLT use from three countries (Eritrea, Iceland and Saudi Arabia) for calculation. South Africa reported on the prevalence of ever use of SLT and therefore we excluded it from this study. We included the findings of the latest surveys, and those representing a wide range of ages (15+ years). We used national estimates of prevalence in all cases except for seven countries (Algeria, Chad, Guinea, Sudan, Saint Kitts and Nevis, Lao People's Democratic Republic and Micronesia), for which we used subnational prevalence in absence of national estimates.

To calculate the number of SLT users, we followed the same method as NCI [1]. To translate prevalence rates into an estimate of the

number of SLT users among adults, we multiplied the adult male and female prevalence rate of SLT users by the male and female adult populations of the corresponding age group in the respective countries. We added the estimated number of SLT users among men and women to get an overall estimate.

2.1 Sample and Coverage

We used country-wise and gender-wise breakdown of the adult population (UN) for the year 2015 to estimate the number of SLT users. [11,12] Countries included in this study represented nearly 90% (specifically 88.1%) of the world's population (Web Table 1). Most of the population in each of the WHO regions was covered; African Region (91.2%), European Region (83.7%), American Region (81.2%), South-East Asia Region (98.7%) and the Western Pacific Region (89.5%). However, the Eastern Mediterranean Region (65.5%) was underrepresented (Web Table 2).

The prevalence data are mainly from the Global Adult Tobacco Surveys (22 countries), Demographic Health Surveys (33 countries), STEPS NCD Risk Factor Surveys (30 countries), the special Europe Barometric Surveys (26 countries) and other national surveys (10) (Web Table1).

By age, the prevalence was available for the 15+ years age group in 56 countries, 15–64 years in 16 countries, 15–49 years in 33 countries and 25–64 years in 16 countries (Web Table 1).

3. RESULTS

In 121 countries, there were 351.9 million SLT users (men 232.7 million [67%] and women 119.2 million [33%]) (Web Table 3), with the

number of users varying greatly across regions and countries (Fig.1 and Fig. 2). Of 352 million SLT users, 333.1 million (94.7%) lived in developing countries and 18.8 million (5.3%) lived in developed countries (Web Table 4).

Web Table 1. Showing the prevalence of smokeless tobacco use by region, country, year, survey type, age group, and gender

#	Country	Survey Year	Title of Survey	Age group (Years)	Indicator	Prevalence(%) (2002-2014)			Ref. No
						Male	Female	Both	
WHO African Region									
1	Algeria*	2010	STEPS	15+	Current SLT use	10.4	0.8	5.7	1,4
2	Benin	2012	DHS	15-49	Current SLT use	4.9	0.7		7
3	Botswana	2007	STEPS	25-64	Current SLT use	7.2	14.5	11.1	10
4	Burkina Faso	2011	DHS	15-49	Current SLT use		3.9		2,7
5	Burundi	2011	DHS	15-49	Current SLT use	0.0	0.3		2,7
6	Cameroon	2011	DHS	15-49	Current SLT use	1.9	0.9		2,7
7	Cape Verde	2007	STEPS	25-64	Current SLT use	3.5	5.8	4.6	1,4
8	Chad*	2008	STEPS	25-64	Current SLT use	1.9	0.4	1.2	1,4
9	Comoros	2012	DHS	15-49	Current SLT use	7.7		3.0	2,7
10	Congo (Brazzaville)	2012	DHS	15-49	Current SLT use	8.3	1.5		2,7
11	Côte d'Ivoire	2012	DHS	15-49	Current SLT use	0.6	1.3		2,7
12	Democratic Republic of the Congo	2013	DHS	15-49	Current SLT use	8.7	3.2		2,7
13	Eritrea	2004	STEPS	15-64	Current daily SLT users	3.2			10
14	Ethiopia	2011	DHS	15-49	Current SLT use	1.9	0.2		2,7
15	Gabon	2012	DHS	15-49	Current SLT use	0.5	0.3		2,7
16	Gambia	2010	STEPS	25-64	Current SLT use	0.8	1.4	1.1	1,4
17	Ghana	2008	DHS	15-49	Current SLT use	1.3	0.2		2,7
18	Guinea*	2009	STEPS	15-64	Current SLT use	1.4	1.5	1.4	1,4
19	Kenya	2014	GATS	15+	Current SLT use	5.3	3.8	4.5	9
20	Lesotho	2009	DHS	15-49	Current SLT use	1.3	9.1		1,4
21	Liberia	2007	DHS	15-49	Current SLT use	2.3	2.4		1,4
22	Madagascar	2008	DHS	15-49	Current SLT use	24.7	19.6		2,7
23	Malawi	2010	DHS	15-49	Current SLT use	0.5	0.8		2,7
24	Mali	2012	DHS	15-49	Current SLT use	5.1	1.0		2,7
25	Mauritania	2006	STEPS	15-64	Current SLT use	5.7	28.3	9.0	1,4
26	Mozambique	2011	DHS	15-49	Current SLT use	10.9	0.8		2,7
27	Namibia	2007	DHS	15-49	Current SLT use	1.8	2.3		1,4
28	Niger	2012	DHS	15-49	Current SLT use	4.6	2.3		2,7
29	Nigeria	2012	GATS	15+	Current SLT use	2.9	0.9	1.9	9
30	Rwanda	2011	DHS	15-49	Current SLT use	5.8	2.7		2,7
31	Sao Tome and Principe	2009	STEPS	25-64	Current SLT use	2.6	0.7		2,7
32	Senegal	2011	DHS	15-49	Current SLT use	6.6	0.2		2,7
33	Sierra Leone	2013	DHS	15-49	Current SLT use	1.5	4.7		2,7
34	Swaziland	2007	STEPS	25-64	Current SLT use	2.6	0.8	1.6	1,4
35	Togo	2010	STEPS	15-64	Consumers of SLT	5.1	2.2	3.6	10
36	Uganda	2013	GATS	15+	Current SLT use	1.7	3.0	2.4	9
37	United Republic of Tanzania	2010	DHS	15-49	Current SLT use	2.0	0.8		2,7
38	Zambia	2007	DHS	15-49	Current SLT use	0.3	1.2		2,7
39	Zimbabwe	2011	DHS	15-49	Current SLT use	1.6	0.4		2,7
WHO Region of the Americas									
1	Argentina	2012	GATS	15+	Current SLT use	0.1	0.2	0.2	9
2	Barbados	2007	STEPS	25+	Current SLT use	0.0	0.6	0.3	1,4
3	Brazil	2008	GATS	15+	Current SLT use	0.6	0.3	0.4	9
4	Canada	2010	CTUMS	15+	Current SLT use	1.0		1.0	1,4
5	Dominican Republic	2007	DHS	15-49	Current SLT use	1.9	0.3		1,4
6	Grenada	2010/11	STEPS	25-64	Current SLT use	2.2	0.3		10
7	Haiti	2005/06	DHS	15-49	Current SLT use		2.5		1,4
8	Mexico	2009	GATS	15+	Current SLT use	0.3	0.3	0.3	9
9	Panama	2013	GATS	15+	Current SLT use	1.0	0.5	0.8	9
10	Paraguay	2011	STEPS	15-74	Current SLT use	3.0	1.6	2.3	5
11	Saint Kitts and Nevis*	2007	STEPS	25-64	Current SLT use	0.3	0.1	0.1	1,4

Table 1 continued.....

12	Trinidad and Tobago	2011	STEPs	15-64	Current SLT use	0.5	0.3	0.4	10
13	United States of America	2012	NSDUH	18+	Current SLT use	7.1	0.4	3.6	1,4
14	Uruguay	2009	GATS	15+	Current SLT use	0.0	0.0	0.0	1,4
15	Venezuela (Bolivarian Republic of)	2011	NSDGP	18-65	Current SLT use	6.2	0.9	3.5	5
WHO Eastern Mediterranean Region									
1	Egypt	2009	GATS	15+	Current SLT use	4.1	0.3	2.2	9
2	Iraq	2006	STEPs	25-65	Current SLT use	1.6	0.3	0.9	10
3	Libya	2009	STEPs	25-64	Current SLT use	2.2	0.1	1.2	1,4
4	Pakistan	2012	DHS	15-49	Current SLT use	15.1	4.6	10.5	6
5	Qatar	2013	GATS	15+	Current SLT use	1.3	0.0	0.7	9
6	Saudi Arabia	2004	STEPs	15-64	Daily users of SLT	1.3	0.5		1,4
7	Sudan*	2005	STEPs	25-64	Users of snuff	25.9	1.0		10
8	Tunisia	2005/06	TAHINA	35-70	Users of snuff	8.6	2.2	5.4	1,4
9	Yemen	2003	FHS	15+	El-shama users	15.1	6.2	10.7	1,4
WHO European Region									
1	Armenia	2005	DHS	15-49	Current SLT use	1.8	0.0		1,4
2	Austria	2012	EBS	15+	Current SLT use	7.8	1.1		3
3	Azerbaijan	2006	DHS	15-49	Current SLT use	0.3			1,4
4	Belgium	2012	EBS	15+	Current SLT use	1.1	0.6		3
5	Bulgaria	2012	EBS	15+	Current SLT use	0.3	0.0		3
6	Cyprus	2012	EBS	15+	Current SLT use	2.1	0.4		3
7	Czech Republic	2012	EBS	15+	Current SLT use	2.5	0.4		3
8	Denmark	2012	EBS	15+	Current SLT use	5.6	0.7		3
9	Estonia	2012	EBS	15+	Current SLT use	5.9	1.9		3
10	Finland	2012	EBS	15+	Current SLT use	6.8	0.1		3
11	France	2012	EBS	15+	Current SLT use	1.2	0.6		3
12	Georgia	2010	STEPs	18-64	Current SLT use	1.0	0.2	0.6	1,4
13	Germany	2012	EBS	15+	Current SLT use	3.4	3.4		3
14	Greece	2013	GATS	15+	Current SLT use	0.2	0.2	0.2	9
15	Hungary	2012	EBS	15+	Current SLT use	0.4	0.3		3
16	Iceland	2008	EBS	15-89	Daily users of SLT	6.0		2.9	1,4
17	Ireland	2012	EBS	15+	Current SLT use	2.2	0.9		3
18	Italy	2012	EBS	15+	Current SLT use	1.8	1.5		3
19	Kyrgyzstan	2005	NEST	15+	Current users of SLT (nasvay user)	7.0	0.3	3.4	1,4
20	Latvia	2012	EBS	15+	Current SLT use	1.3	0.2		3
21	Lithuania	2012	EBS	15+	Current SLT use	1.2	0.2		3
22	Luxembourg	2012	EBS	15+	Current SLT use	1.8	1.0		3
23	Malta	2012	EBS	15+	Current SLT use	5.5	1.5		3
24	Netherlands	2011	EBS	15-100	Current SLT use	0.7	0.2		3
25	Norway	2009	SNTHS	16-74	Current SLT use	17.0	5.0	10.0	1,4
26	Poland	2009	GATS	15+	Current SLT use	1.0	0.1	0.5	9
27	Portugal	2012	EBS	15+	Current SLT use	4.4	1.1		3
28	Republic of Moldova	2013	STEPs	18-69	Current SLT use	0.1	0.0	0.0	10
29	Romania	2012	EBS	15+	Current SLT use	0.4	0.2		3
30	Russian Federation	2009	GATS	15+	Current SLT use	1.0	0.2	0.6	9
31	Slovakia	2012	EBS	15+	Current SLT use	3.9	0.7		3
32	Slovenia	2012	EBS	15+	Current SLT use	1.8	0.4		3
33	Spain	2012	EBS	15+	Current SLT use	0.4	0.2		3
34	Sweden	2012	EBS	15+	Current SLT use	27.7	7.9		3
35	Switzerland	2011	SST	15+	Current SLT use	4.0	1.3	2.6	5
36	Ukraine	2009	GATS	15+	Current SLT use	0.5	0.0	0.2	9
37	United Kingdom	2012	EBS	15+	Current SLT use	1.6	0.5		3
38	Uzbekistan	2006	EHCS	15+	Current SLT use	22.5	0.4	11.3	1,4
WHO South-East Asia Region									
1	Bangladesh	2009	GATS	15+	Current SLT use	26.4	27.9	31.7	9
2	Bhutan	2014	STEPs	18-69	Current SLT use	26.5	11.0	19.7	10
3	India	2009	GATS	15+	Current SLT use	32.9	18.4	25.9	1,4
4	Indonesia	2011	GATS	15+	Current SLT use	1.5	2.0	1.7	9
5	Maldives	2009	DHS	15-49	Current SLT use	6.0	4.2		1,4
6	Myanmar	2009	STEPs	15-64	Current SLT use	51.4	16.1	29.6	1,4
7	Nepal	2011	DHS	15-49	Current SLT use	34.8	4.8		6,8
8	Sri Lanka	2006	STEPs	15-64	Current SLT use	24.9	6.9	15.8	1, 2, 8
9	Thailand	2011	GATS	15+	Current SLT use	1.1	5.2	3.2	9

Table 1 continued.....

10	Timor-Leste	2009/10	DHS	15-49	Current SLT use	2.5	1.9		1,4
WHO Western Pacific Region									
1	Australia	2004	NDSHS	12+	Current SLT use	0.8	0.4	0.6	1,4
2	Cambodia	2010	STEPS	25-64	Current SLT use	2.2	14.9	8.8	10
3	China	2009	GATS	15+	Current SLT use	0.7	0.0	0.4	1,4
4	Lao People's Democratic Republic*	2008	STEPS	25-64	Current SLT use	14.6	1.1	7.9	10
5	Malaysia	2011	GATS	15+	Current SLT use	0.9	0.6	0.7	9
6	Micronesia (Federated States of)*	2002	STEPS	25-64	Current SLT use	22.4	3.0	11.4	1,4
7	Mongolia	2009	STEPS	15-64	Current SLT use	2.8	0.5	1.7	1,4
8	Niue	2011	STEPS	15+	Current SLT use	0.3	0.2	0.2	10
9	Philippines	2009	GATS	15+	Current SLT use	2.7	1.2	1.9	1,4
10	Viet Nam	2010	GATS	15+	Current SLT use	0.3	2.3	1.3	1,4

***Sub-national data
Total countries – 121**

Acronyms

GATS	- Global Adult Tobacco Survey
STEPS	- NCD Risk Factor Survey
DHS	- Demographic Health Survey
NDSHS	- National Drug Strategy Household Survey
NSDUH	- National Survey on Drug Use and Health
NSDGP	- National Survey on Drugs in the General Population
TAHINA	- National Survey "TAHINA" (National Institute of Public Health)
FHS	- Family Health Survey
EBS	- The special Europe Barometer Survey
NEST	- National Epidemiological Study of Tobacco Use Prevalence in Kyrgyzstan
SNTHS	- Statistics Norway Travel and holiday survey
SST	- Tobacco Monitoring - Swiss survey on tobacco use
EHCS	- Economic and Health Costs of Smoking in Uzbekistan
SLT	- Smokeless Tobacco

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Web Table 2. Showing total population and coverage of populaiotn in the countries who have prevalence of smokeless tobacco use by WHO region

#	Country	Total populations ¹ (in millions)	#	Country who have prevalence of smokeless tobacco use known	Total populations ¹ (in millions)
WHO African Region					
1	Algeria	40633.5	1	Algeria	40633.5
2	Angola	22819.9			
3	Benin	10879.8	2	Benin	10879.8
4	Botswana	2056.4	3	Botswana	2056.4
5	Burkina Faso	17914.6	4	Burkina Faso	17914.6
6	Burundi	10812.6	5	Burundi	10812.6
7	Cape Verde	508.3	6	Cape Verde	508.3
8	Cameroon	23393.1	7	Cameroon	23393.1
9	Central African Republic	4803.1			
10	Chad	13605.6	8	Chad	13605.6
11	Comoros	770.1	9	Comoros	770.1
12	Congo (Brazzaville)	4671.1	10	Congo (Brazzaville)	4671.1
13	Côte d'Ivoire	21295.3	11	Côte d'Ivoire	21295.3
14	Democratic Republic of the Congo	71246.4	12	Democratic Republic of the Congo	71246.4
15	Equatorial Guinea	799.4			
16	Eritrea	6737.6	13	Eritrea	6737.6
17	Ethiopia	98942.1	14	Ethiopia	98942.1
18	Gabon	1751.2	15	Gabon	1751.2
19	Gambia	1970.1	16	Gambia	1970.1
20	Ghana	26984.3	17	Ghana	26984.3
21	Guinea	12347.8	18	Guinea	12347.8
22	Guinea-Bissau	1787.8			
23	Kenya	46748.6	19	Kenya	46748.6
24	Lesotho	2120.1	20	Lesotho	2120.1
25	Liberia	4503.4	21	Liberia	4503.4
26	Madagascar	24235.4	22	Madagascar	24235.4
27	Malawi	17308.7	23	Malawi	17308.7
28	Mali	16258.6	24	Mali	16258.6
29	Mauritania	4080.2	25	Mauritania	4080.2
30	Mauritius	1253.6			
31	Mozambique	27121.8	26	Mozambique	27121.8
32	Namibia	2392.4	27	Namibia	2392.4
33	Niger	19268.4	28	Niger	19268.4
34	Nigeria	183523.4	29	Nigeria	183523.4
35	Rwanda	12428.0	30	Rwanda	12428.0
36	Sao Tome and Principe	202.8	31	Sao Tome and Principe	202.8
37	Senegal	14967.4	32	Senegal	14967.4
38	Seychelles	93.8			
39	Sierra Leone	6318.6	33	Sierra Leone	6318.6
40	South Africa	53491.3			
41	Swaziland	1285.5	34	Swaziland	1285.5
42	Togo	7170.8	35	Togo	7170.8
43	Uganda	40141.3	36	Uganda	40141.3
44	United Republic of Tanzania	52290.8	37	United Republic of Tanzania	52290.8
45	Zambia	15519.6	38	Zambia	15519.6
46	Zimbabwe	15046.1	39	Zimbabwe	15046.1
African Region's total population		964.5			879.5
		100.0%			91.2%
WHO Region of the Americas					
1	Antigua and Barbuda	91.8			
2	Argentina	42154.9	1	Argentina	42154.9
3	Bahamas	387.5			
4	Barbados	287.5	2	Barbados	287.5
5	Belize	347.6	3	Brazil	203657.2
6	Bolivia (Plurinational State of)	11024.5			
7	Brazil	203657.2			
8	Canada	35871.3	4	Canada	35871.3
9	Chile	17924.1			

Table 2 continued.....

10	Colombia	49529.2			
11	Costa Rica	5001.7			
12	Cuba	11248.8			
13	Dominica ²	72.0			
14	Dominican Republic	10652.1	5	Dominican Republic	10652.1
15	Ecuador	16225.7			
16	El Salvador	6426.0			
17	Grenada	106.7	6	Grenada	106.7
18	Guatemala	16255.1			
19	Guyana	807.6			
20	Haiti	10603.7	7	Haiti	10603.7
21	Honduras	8423.9			
22	Jamaica	2813.3			
23	Mexico	125235.6	8	Mexico	125235.6
24	Nicaragua	6256.5			
25	Panama	3987.9	9	Panama	3987.9
26	Paraguay	7032.9	10	Paraguay	7032.9
27	Peru	31161.2			
28	Saint Kitts and Nevis ²	54.0	11	Saint Kitts and Nevis ²	54.0
29	Saint Lucia	184.9			
30	Saint Vincent and the Grenadines	109.4			
31	Suriname	548.5			
32	Trinidad and Tobago	1346.7	12	Trinidad and Tobago	1346.7
33	United States of America	325127.6	13	United States of America	325127.6
34	Uruguay	3430.0	14	Uruguay	3430.0
35	Venezuela (Bolivarian Republic of)	31292.7	15	Venezuela (Bolivarian Republic of)	31292.7
American Region's total population		985.7			800.8
		100.0%			81.2%
WHO South-East Asia Region					
1	Bangladesh	160411.2	1	Bangladesh	160411.2
2	Bhutan	776.5	2	Bhutan	776.5
3	Democratic People's Republic of Korea	25155.3			
4	India	1282390.3	3	India	1282390.3
5	Indonesia	255708.8	4	Indonesia	255708.8
6	Maldives	358.0	5	Maldives	358.0
7	Myanmar	54164.3	6	Myanmar	54164.3
8	Nepal	28440.6	7	Nepal	28440.6
9	Sri Lanka	21611.8	8	Sri Lanka	21611.8
10	Thailand	67400.7	9	Thailand	67400.7
11	Timor-Leste	1172.7	10	Timor-Leste	1172.7
South-East Asia Region's total population		1897.6			1872.4
		100.0%			98.7%
WHO European Region					
1	Albania	3197.0			
2	Andorra ²	78.0			
3	Armenia	2989.5	1	Armenia	2989.5
4	Austria	8557.8	2	Austria	8557.8
5	Azerbaijan	9612.6	3	Azerbaijan	9612.6
6	Belarus	9259.7			
7	Belgium	11183.4	4	Belgium	11183.4
8	Bosnia and Herzegovina	3819.7			
9	Bulgaria	7112.6	5	Bulgaria	7112.6
10	Croatia	4255.4			
11	Cyprus	1164.7	6	Cyprus	1164.7
12	Czech Republic	10777.1	7	Czech Republic	10777.1
13	Denmark	5661.7	8	Denmark	5661.7
14	Estonia	1280.2	9	Estonia	1280.2
15	Finland	5460.6	10	Finland	5460.6
16	France	64982.9	11	France	64982.9
17	Georgia	4304.5	12	Georgia	4304.5
18	Germany	82562.0	13	Germany	82562.0
19	Greece	11125.8	14	Greece	11125.8
20	Hungary	9911.4	15	Hungary	9911.4
21	Iceland	336.7	16	Iceland	336.7

Table 2 continued.....

22	Ireland	4726.9	17	Ireland	4726.9
23	Israel	7919.5			
24	Italy	61142.2	18	Italy	61142.2
25	Kazakhstan	16770.4			
26	Kyrgyzstan	5707.5	19	Kyrgyzstan	5707.5
27	Latvia	2031.4	20	Latvia	2031.4
28	Lithuania	2999.0	21	Lithuania	2999.0
29	Luxembourg	543.3	22	Luxembourg	543.3
30	Malta	431.2	23	Malta	431.2
31	Monaco ²	38.0			
32	Montenegro	621.6			
33	Netherlands	16844.2	24	Netherlands	16844.2
34	Norway	5142.8	25	Norway	5142.8
35	Poland	38221.6	26	Poland	38221.6
36	Portugal	10610.0	27	Portugal	10610.0
37	Republic of Moldova	3436.8	28	Republic of Moldova	3436.8
38	Romania	21579.2	29	Romania	21579.2
39	Russian Federation	142098.1	30	Russian Federation	142098.1
40	San Marino ²	31.0			
41	Serbia	9424.0			
42	Slovakia	5457.9	31	Slovakia	5457.9
43	Slovenia	2079.1	32	Slovenia	2079.1
44	Spain	47199.1	33	Spain	47199.1
45	Sweden	9693.9	34	Sweden	9693.9
46	Switzerland	8238.6	35	Switzerland	8238.6
47	Tajikistan	8610.4			
48	The former Yugoslav Republic of Macedonia	2109.3			
49	Turkey	76690.5			
50	Turkmenistan	5373.5			
51	Ukraine	44646.1	36	Ukraine	44646.1
52	United Kingdom	63843.9	37	United Kingdom	63843.9
53	Uzbekistan	29709.9	38	Uzbekistan	29709.9
European Region's total population		911.6			763.4
		100.0%			83.7%
WHO Eastern Mediterranean Region					
1	Afghanistan	32006.8			
2	Bahrain	1359.7			
3	Djibouti	899.7			
4	Egypt	84705.7	1	Egypt	84705.7
5	Iran (Islamic Republic of)	79476.3			
6	Iraq	35766.7	2	Iraq	35766.7
7	Jordan	7689.8			
8	Kuwait	3583.4			
9	Lebanon	5053.6			
10	Libya	6317.1	3	Libya	6317.1
11	Morocco	33955.2			
12	Oman	4157.8			
13	Pakistan	188144.0	4	Pakistan	188144.0
14	Qatar	2350.5	5	Qatar	2350.5
15	Saudi Arabia	29897.7	6	Saudi Arabia	29897.7
16	Somalia	11122.7			
17	South Sudan	12152.3			
18	Sudan	39613.2	7	Sudan	39613.2
19	Syrian Arab Republic	22265.0			
20	Tunisia	11235.2	8	Tunisia	11235.2
21	United Arab Emirates	9577.1			
22	Yemen	25535.1	9	Yemen	25535.1
East Mediterranean Region's total population		646.9			423.6
		100.0%			65.5%
WHO Western Pacific Region					
1	Australia	23923.1	1	Australia	23923.1
2	Brunei Darussalam	428.5			
3	Cambodia	15677.1	2	Cambodia	15677.1
4	China	1401586.6	3	China	1401586.6
5	Cook Islands ²	21.0			
6	Fiji	892.7			

Table 2 continued.....

7	Japan	126818.0			
8	Kiribati	105.6			
9	Lao People's Democratic Republic	7019.7	4	Lao People's Democratic Republic	7019.7
10	Malaysia	30651.2	5	Malaysia	30651.2
11	Marshall Islands ²	53.0			
12	Micronesia (Federated States of)	104.5	6	Micronesia (Federated States of)	104.5
13	Mongolia	2923.1	7	Mongolia	2923.1
14	Nauru ²	10.0			
15	New Zealand	4596.4			
16	Niue ²	1.7	8	Niue ²	1.7
17	Palau ²	21.0			
18	Papua New Guinea	7631.8			
19	Philippines	101802.7	9	Philippines	101802.7
20	Republic of Korea	49750.2			
21	Samoa	193.2			
22	Singapore	5618.9			
23	Solomon Islands	584.5			
24	Tonga	106.4			
25	Tuvalu ²	10.0			
26	Vanuatu	263.9			
27	Viet Nam	93386.6	10	Viet Nam	93386.6
Western Region's total population		1874.2			1677.1
		100.0%			89.5%
World's (194 countries) total population		7280.4		SLT prevalent 121 countries	6416.8
		100.0%			88.1%

1. World Population Prospects: The 2012 Revision. New York: Population Division, Department of Economics and Social Affairs, United Nations Secretariat; 2013 (Refer reference 11 of the manuscript)

2. World Health Organization, World Health Statistics, 2014, WHO, Geneva, Switzerland. (Refer reference 12 of the manuscript)

Web Table 3. Showing the prevalence and number of smokeless tobacco users by WHO region and country

#	Country	Projected population for year 2015 ¹ (in millions)		SLT Prevalence (%) (2002-2014)			Estimated smokeless tobacco users (in millions)		
		Male	Female	Male	Female	Both	Male	Female	Both
WHO African Region									
1	Algeria	14.6	14.5	10.4	0.8	5.7	1.5	0.1	1.6
2	Benin	2.6	2.6	4.9	0.7		0.1	0.0	0.1
3	Botswana	0.4	0.4	7.2	14.5	11.1	0.0	0.1	0.1
4	Burkina Faso	4.2	4.2		3.9			0.2	0.2
5	Burundi	2.4	2.6	0.0	0.3		0.0	0.0	0.0
6	Cameroon	5.6	5.6	1.9	0.9		0.1	0.1	0.2
7	Cape Verde	0.1	0.1	3.5	5.8	4.6	0.0	0.0	0.0
8	Chad	2.0	2.0	1.9	0.4	1.2	0.0	0.0	0.0
9	Comoros	0.2	0.2	7.7		3.0	0.0	0.0	0.0
10	Congo (Brazzaville)	1.1	1.1	8.3	1.5		0.1	0.0	0.1
11	Côte d'Ivoire	5.2	5.1	0.6	1.3		0.0	0.1	0.1
12	Democratic Republic of the Congo	16.4	16.5	8.7	3.2		1.4	0.5	2.0
13	Eritrea	1.8	1.9	3.2			0.1	0.0	0.1
14	Ethiopia	24.0	24.0	1.9	0.2		0.5	0.0	0.5
15	Gabon	0.4	0.4	0.5	0.3		0.0	0.0	0.0
16	Gambia	0.3	0.3	0.8	1.4	1.1	0.0	0.0	0.0
17	Ghana	6.7	6.9	1.3	0.2		0.1	0.0	0.1
18	Guinea	3.4	3.4	1.4	1.5	1.4	0.0	0.1	0.1
19	Kenya	13.5	13.7	5.3	3.8	4.5	0.7	0.5	1.2
20	Lesotho	0.6	0.6	1.3	9.1		0.0	0.1	0.1
21	Liberia	1.1	1.1	2.3	2.4		0.0	0.0	0.1
22	Madagascar	5.8	5.9	24.7	19.6		1.4	1.1	2.6
23	Malawi	4.1	3.9	0.5	0.8		0.0	0.0	0.1
24	Mali	3.7	3.5	5.1	1.0		0.2	0.0	0.2
25	Mauritania	1.2	1.2	5.7	28.3	9.0	0.1	0.3	0.4
26	Mozambique	6.0	6.2	10.9	0.8		0.7	0.0	0.7
27	Namibia	0.6	0.7	1.8	2.3		0.0	0.0	0.0

Table 3 continued.....

28	Niger	3.8	4.0	4.6	2.3		0.2	0.1	0.3
29	Nigeria	51.7	50.3	2.9	0.9	1.9	1.5	0.5	2.0
30	Rwanda	3.0	3.2	5.8	2.7		0.2	0.1	0.3
31	Sao Tome and Principe	0.0	0.0	2.6	0.7		0.0	0.0	0.0
32	Senegal	3.5	3.6	6.6	0.2		0.2	0.0	0.2
33	Sierra Leone	1.6	1.6	1.5	4.7		0.0	0.1	0.1
34	Swaziland	0.2	0.2	2.6	0.8	1.6	0.0	0.0	0.0
35	Togo	2.0	2.0	5.1	2.2	3.6	0.1	0.0	0.1
36	Uganda	10.4	10.5	1.7	3.0	2.4	0.2	0.3	0.5
37	United Republic of Tanzania	12.1	11.9	2.0	0.8		0.2	0.1	0.3
38	Zambia	3.6	3.6	0.3	1.2		0.0	0.0	0.1
39	Zimbabwe	3.9	3.9	1.6	0.4		0.1	0.0	0.1
WHO Region of the Americas									
1	Argentina	15.5	16.6	0.1	0.2	0.2	0.0	0.0	0.0
2	Barbados	0.1	0.1	0.0	0.6	0.3	0.0	0.0	0.0
3	Brazil	76.0	80.5	0.6	0.3	0.4	0.5	0.2	0.7
4	Canada	14.8	15.2	1.0		1.0	0.1	0.0	0.1
5	Dominican Republic	2.8	2.8	1.9	0.3		0.1	0.0	0.1
6	Grenada	0.0	0.0	2.2	0.3		0.0	0.0	0.0
7	Haiti	2.7	2.8		2.5		0.0	0.1	0.1
8	Mexico	43.1	47.7	0.3	0.3	0.3	0.1	0.1	0.3
9	Panama	1.5	1.4	1.0	0.5	0.8	0.0	0.0	0.0
10	Paraguay	2.2	2.2	3.0	1.6	2.3	0.1	0.0	0.1
11	Saint Kitts and Nevis ²	0.1	0.0	0.3	0.1	0.1	0.0	0.0	0.0
12	Trinidad and Tobago	0.5	0.5	0.5	0.3	0.4	0.0	0.0	0.0
13	United States of America	127.9	134.2	7.1	0.4	3.6	9.1	0.5	9.6
14	Uruguay	1.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0
15	Venezuela (Bolivarian Republic of)	10.3	10.2	6.2	0.9	3.5	0.6	0.1	0.7
WHO Eastern Mediterranean Region									
1	Egypt	29.2	29.4	4.1	0.3	2.2	1.2	0.1	1.3
2	Iraq	6.7	6.7	1.6	0.3	0.9	0.1	0.0	0.1
3	Libya	1.5	1.6	2.2	0.1	1.2	0.0	0.0	0.0
4	Pakistan	51.6	49.3	15.1	4.6	10.5	7.8	2.3	10.1
5	Qatar	1.6	0.4	1.3	0.0	0.7	0.0	0.0	0.0
6	Saudi Arabia	12.5	8.0	1.3	0.5		0.2	0.0	0.2
7	Sudan	7.1	7.2	25.9	1.0		1.8	0.1	1.9
8	Tunisia	2.9	3.1	8.6	2.2	5.4	0.3	0.1	0.3
9	Yemen	7.8	7.8	15.1	6.2	10.7	1.2	0.5	1.7
WHO European Region									
1	Armenia	0.8	0.7	1.8	0.0		0.0	0.0	0.0
2	Austria	3.6	3.8	7.8	1.1		0.3	0.0	0.3
3	Azerbaijan	2.7	2.7	0.3			0.0	0.0	0.0
4	Belgium	4.5	4.8	1.1	0.6		0.0	0.0	0.1
5	Bulgaria	2.9	3.2	0.3	0.0		0.0	0.0	0.0
6	Cyprus	0.5	0.5	2.1	0.4		0.0	0.0	0.0
7	Czech Republic	4.5	4.7	2.5	0.4		0.1	0.0	0.1
8	Denmark	2.3	2.4	5.6	0.7		0.1	0.0	0.1
9	Estonia	0.5	0.6	5.9	1.9		0.0	0.0	0.0
10	Finland	2.2	2.3	6.8	0.1		0.2	0.0	0.2
11	France	25.5	27.7	1.2	0.6		0.3	0.2	0.5
12	Georgia	1.4	1.5	1.0	0.2	0.6	0.0	0.0	0.0
13	Germany	35.1	36.8	3.4	3.4		1.2	1.3	2.4
14	Greece	4.7	4.8	0.2	0.2	0.2	0.0	0.0	0.0
15	Hungary	4.0	4.5	0.4	0.3		0.0	0.0	0.0
16	Iceland	0.1	0.1	6.0		2.9	0.0	0.0	0.0
17	Ireland	1.8	1.9	2.2	0.9		0.0	0.0	0.1
18	Italy	25.3	27.2	1.8	1.5		0.5	0.4	0.9
19	Kyrgyzstan	1.9	2.0	7.0	0.3	3.4	0.1	0.0	0.1
20	Latvia	0.8	0.9	1.3	0.2		0.0	0.0	0.0
21	Lithuania	1.1	1.4	1.2	0.2		0.0	0.0	0.0
22	Luxembourg	0.2	0.2	1.8	1.0		0.0	0.0	0.0
23	Malta	0.2	0.2	5.5	1.5		0.0	0.0	0.0
24	Netherlands	6.9	7.1	0.7	0.2		0.0	0.0	0.1
25	Norway	1.7	1.6	17.0	5.0	10.0	0.3	0.1	0.4
26	Poland	15.5	17.0	1.0	0.1	0.5	0.2	0.0	0.2
27	Portugal	4.4	4.7	4.4	1.1		0.2	0.1	0.2
28	Republic of Moldova	1.2	1.3	0.1	0.0	0.0	0.0	0.0	0.0
29	Romania	8.8	9.5	0.4	0.2		0.0	0.0	0.1
30	Russian Federation	53.5	65.2	1.0	0.2	0.6	0.5	0.1	0.7

Table 3 continued.....

31	Slovakia	2.2	2.4	3.9	0.7		0.1	0.0	0.1
32	Slovenia	0.9	0.9	1.8	0.4		0.0	0.0	0.0
33	Spain	19.6	20.3	0.4	0.2		0.1	0.0	0.1
34	Sweden	4.0	4.0	27.7	7.9		1.1	0.3	1.4
35	Switzerland	3.4	3.6	4.0	1.3	2.6	0.1	0.0	0.2
36	Ukraine	17.1	20.8	0.5	0.0	0.2	0.1	0.0	0.1
37	United Kingdom	25.7	26.9	1.6	0.5		0.4	0.1	0.5
38	Uzbekistan	10.5	10.8	22.5	0.4	11.3	2.4	0.0	2.4
WHO South-East Asia Region									
1	Bangladesh	57.3	56.7	26.4	27.9	31.7	15.1	15.8	30.9
2	Bhutan	0.3	0.2	26.5	11.0	19.7	0.1	0.0	0.1
3	India	471.3	447.2	32.9	18.4	25.9	155.1	82.3	237.4
4	Indonesia	91.8	92.2	1.5	2.0	1.7	1.4	1.8	3.2
5	Maldives	0.1	0.1	6.0	4.2		0.0	0.0	0.0
6	Myanmar	18.4	19.7	51.4	16.1	29.6	9.5	3.2	12.6
7	Nepal	6.7	7.9	34.8	4.8		2.3	0.4	2.7
8	Sri Lanka	6.9	7.3	24.9	6.9	15.8	1.7	0.5	2.2
9	Thailand	27.0	28.7	1.1	5.2	3.2	0.3	1.5	1.8
10	Timor-Leste	0.3	0.3	2.5	1.9		0.0	0.0	0.0
WHO Western Pacific Region									
1	Australia	9.5	9.8	0.8	0.4	0.6	0.1	0.0	0.1
2	Cambodia	3.3	3.7	2.2	14.9	8.8	0.1	0.5	0.6
3	China	589.6	557.4	0.7	0.0	0.4	4.1	0.0	4.1
4	Lao People's Democratic Republic	1.4	1.4	14.6	1.1	7.9	0.2	0.0	0.2
5	Malaysia	11.1	11.9	0.9	0.6	0.7	0.1	0.1	0.2
6	Micronesia (Federated States of)	0.0	0.0	22.4	3.0	11.4	0.0	0.0	0.0
7	Mongolia	1.0	1.0	2.8	0.5	1.7	0.0	0.0	0.0
8	Niue ²	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.0
9	Philippines	33.6	34.2	2.7	1.2	1.9	0.9	0.4	1.3
10	Viet Nam	35.2	37.2	0.3	2.3	1.3	0.1	0.9	1.0
Total		2310.3	2300.4				232.7	119.2	351.9

Estimated total SLT users (121 countries) 351.9 millions

1. World Population Prospects: The 2012 Revision. New York: Population Division, Department of Economics and Social Affairs, United Nations Secretariat; 2013 (Refer reference 11 of the manuscript)

2. World Health Organization, World Health Statistics, 2014, WHO, Geneva, Switzerland. (Refer reference 12 of the manuscript)

Web Table 4. Showing the number of smokeless tobacco users by economic division

#	Country	Projected population for year 2015 ¹ (in millions)		SLT Prevalence (%) (2002-2014)			Estimated smokeless tobacco users (in millions)		
		Male	Female	Male	Female	Both	Male	Female	Both
Developing countries²									
1	Algeria	14.6	14.5	10.4	0.8	5.7	1.5	0.1	1.6
2	Argentina	15.5	16.6	0.1	0.2	0.2	0.0	0.0	0.0
3	Armenia	0.8	0.7	1.8	0.0		0.0	0.0	0.0
4	Azerbaijan	2.7	2.7	0.3			0.0	0.0	0.0
5	Bangladesh	57.3	56.7	26.4	27.9	31.7	15.1	15.8	30.9
6	Benin	2.6	2.6	4.9	0.7		0.1	0.0	0.1
7	Bhutan	0.3	0.2	26.5	11.0	19.7	0.1	0.0	0.1
8	Botswana	0.4	0.4	7.2	14.5	11.1	0.0	0.1	0.1
9	Brazil	76.0	80.5	0.6	0.3	0.4	0.5	0.2	0.7
10	Bulgaria	2.9	3.2	0.3	0.0		0.0	0.0	0.0
11	Burkina Faso	4.2	4.2		3.9			0.2	0.2
12	Burundi	2.4	2.6	0.0	0.3		0.0	0.0	0.0
13	Cambodia	3.3	3.7	2.2	14.9	8.8	0.1	0.5	0.6
14	Cameroon	5.6	5.6	1.9	0.9		0.1	0.1	0.2
15	Cape Verde	0.1	0.1	3.5	5.8	4.6	0.0	0.0	0.0
16	Chad	2.0	2.0	1.9	0.4	1.2	0.0	0.0	0.0
17	China	589.6	557.4	0.7	0.0	0.4	4.1	0.0	4.1
18	Comoros	0.2	0.2	7.7		3.0	0.0	0.0	0.0
19	Congo (Brazzaville)	1.1	1.1	8.3	1.5		0.1	0.0	0.1

Table 4 continued.....

20	Côte d'Ivoire	5.2	5.1	0.6	1.3		0.0	0.1	0.1
21	Democratic Republic of the Congo	16.4	16.5	8.7	3.2		1.4	0.5	2.0
22	Dominican Republic	2.8	2.8	1.9	0.3		0.1	0.0	0.1
23	Egypt	29.2	29.4	4.1	0.3	2.2	1.2	0.1	1.3
24	Eritrea	1.8	1.9	3.2			0.1	0.0	0.1
25	Ethiopia	24.0	24.0	1.9	0.2		0.5	0.0	0.5
26	Gabon	0.4	0.4	0.5	0.3		0.0	0.0	0.0
27	Gambia	0.3	0.3	0.8	1.4	1.1	0.0	0.0	0.0
28	Georgia	1.4	1.5	1.0	0.2	0.6	0.0	0.0	0.0
29	Ghana	6.7	6.9	1.3	0.2		0.1	0.0	0.1
30	Grenada	0.0	0.0	2.2	0.3		0.0	0.0	0.0
31	Guinea	3.4	3.4	1.4	1.5	1.4	0.0	0.1	0.1
32	Haiti	2.7	2.8		2.5		0.0	0.1	0.1
33	Hungary	4.0	4.5	0.4	0.3		0.0	0.0	0.0
34	India	471.3	447.2	32.9	18.4	25.9	155.1	82.3	237.4
35	Indonesia	91.8	92.2	1.5	2.0	1.7	1.4	1.8	3.2
36	Iraq	6.7	6.7	1.6	0.3	0.9	0.1	0.0	0.1
37	Kenya	13.5	13.7	5.3	3.8	4.5	0.7	0.5	1.2
38	Kyrgyzstan	1.9	2.0	7.0	0.3	3.4	0.1	0.0	0.1
39	Lao People's Democratic Republic	1.4	1.4	14.6	1.1	7.9	0.2	0.0	0.2
40	Lesotho	0.6	0.6	1.3	9.1		0.0	0.1	0.1
41	Liberia	1.1	1.1	2.3	2.4		0.0	0.0	0.1
42	Libya	1.5	1.6	2.2	0.1	1.2	0.0	0.0	0.0
43	Madagascar	5.8	5.9	24.7	19.6		1.4	1.1	2.6
44	Malawi	4.1	3.9	0.5	0.8		0.0	0.0	0.1
45	Malaysia	11.1	11.9	0.9	0.6	0.7	0.1	0.1	0.2
46	Maldives	0.1	0.1	6.0	4.2		0.0	0.0	0.0
47	Mali	3.7	3.5	5.1	1.0		0.2	0.0	0.2
48	Mauritania	1.2	1.2	5.7	28.3	9.0	0.1	0.3	0.4
49	Mexico	43.1	47.7	0.3	0.3	0.3	0.1	0.1	0.3
50	Micronesia (Federated States of)	0.0	0.0	22.4	3.0	11.4	0.0	0.0	0.0
51	Mongolia	1.0	1.0	2.8	0.5	1.7	0.0	0.0	0.0
52	Mozambique	6.0	6.2	10.9	0.8		0.7	0.0	0.7
53	Myanmar	18.4	19.7	51.4	16.1	29.6	9.5	3.2	12.6
54	Namibia	0.6	0.7	1.8	2.3		0.0	0.0	0.0
55	Nepal	6.7	7.9	34.8	4.8		2.3	0.4	2.7
56	Niger	3.8	4.0	4.6	2.3		0.2	0.1	0.3
57	Nigeria	51.7	50.3	2.9	0.9	1.9	1.5	0.5	2.0
58	Niue	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.0
59	Pakistan	51.6	49.3	15.1	4.6	10.5	7.8	2.3	10.1
60	Panama	1.5	1.4	1.0	0.5	0.8	0.0	0.0	0.0
61	Paraguay	2.2	2.2	3.0	1.6	2.3	0.1	0.0	0.1
62	Philippines	33.6	34.2	2.7	1.2	1.9	0.9	0.4	1.3
63	Republic of Moldova	1.2	1.3	0.1	0.0	0.0	0.0	0.0	0.0
64	Romania	8.8	9.5	0.4	0.2		0.0	0.0	0.1
65	Rwanda	3.0	3.2	5.8	2.7		0.2	0.1	0.3
66	Sao Tome and Principe	0.0	0.0	2.6	0.7		0.0	0.0	0.0
67	Senegal	3.5	3.6	6.6	0.2		0.2	0.0	0.2
68	Sierra Leone	1.6	1.6	1.5	4.7		0.0	0.1	0.1
69	Sri Lanka	6.9	7.3	24.9	6.9	15.8	1.7	0.5	2.2
70	Sudan	7.1	7.2	25.9	1.0		1.8	0.1	1.9
71	Swaziland	0.2	0.2	2.6	0.8	1.6	0.0	0.0	0.0
72	Thailand	27.0	28.7	1.1	5.2	3.2	0.3	1.5	1.8
73	Timor-Leste	0.3	0.3	2.5	1.9		0.0	0.0	0.0
74	Togo	2.0	2.0	5.1	2.2	3.6	0.1	0.0	0.1
75	Tunisia	2.9	3.1	8.6	2.2	5.4	0.3	0.1	0.3
76	Uganda	10.4	10.5	1.7	3.0	2.4	0.2	0.3	0.5
77	Ukraine	17.1	20.8	0.5	0.0	0.2	0.1	0.0	0.1
78	United Republic of Tanzania	12.1	11.9	2.0	0.8		0.2	0.1	0.3
79	Uzbekistan	10.5	10.8	22.5	0.4	11.3	2.4	0.0	2.4
80	Venezuela (Bolivarian Republic of)	10.3	10.2	6.2	0.9	3.5	0.6	0.1	0.7
81	Viet Nam	35.2	37.2	0.3	2.3	1.3	0.1	0.9	1.0
82	Yemen	7.8	7.8	15.1	6.2	10.7	1.2	0.5	1.7
83	Zambia	3.6	3.6	0.3	1.2		0.0	0.0	0.1
84	Zimbabwe	3.9	3.9	1.6	0.4		0.1	0.0	0.1

Table 4 continued.....

Total		1891.5	1856.8			217.4	115.7	333.1
Developed countries²								
1	Australia	9.5	9.8	0.8	0.4	0.6	0.1	0.0
2	Austria	3.6	3.8	7.8	1.1		0.3	0.0
3	Barbados	0.1	0.1	0.0	0.6	0.3	0.0	0.0
4	Belgium	4.5	4.8	1.1	0.6		0.0	0.0
5	Canada	14.8	15.2	1.0		1.0	0.1	0.0
6	Cyprus	0.5	0.5	2.1	0.4		0.0	0.0
7	Czech Republic	4.5	4.7	2.5	0.4		0.1	0.0
8	Denmark	2.3	2.4	5.6	0.7		0.1	0.0
9	Estonia	0.5	0.6	5.9	1.9		0.0	0.0
10	Finland	2.2	2.3	6.8	0.1		0.2	0.0
11	France	25.5	27.7	1.2	0.6		0.3	0.2
12	Germany	35.1	36.8	3.4	3.4		1.2	1.3
13	Greece	4.7	4.8	0.2	0.2	0.2	0.0	0.0
14	Iceland	0.1	0.1	6.0		2.9	0.0	0.0
15	Ireland	1.8	1.9	2.2	0.9		0.0	0.0
16	Italy	25.3	27.2	1.8	1.5		0.5	0.4
17	Latvia	0.8	0.9	1.3	0.2		0.0	0.0
18	Lithuania	1.1	1.4	1.2	0.2		0.0	0.0
19	Luxembourg	0.2	0.2	1.8	1.0		0.0	0.0
20	Malta	0.2	0.2	5.5	1.5		0.0	0.0
21	Netherlands	6.9	7.1	0.7	0.2		0.0	0.0
22	Norway	1.7	1.6	17.0	5.0	10.0	0.3	0.1
23	Poland	15.5	17.0	1.0	0.1	0.5	0.2	0.0
24	Portugal	4.4	4.7	4.4	1.1		0.2	0.1
25	Qatar	1.6	0.4	1.3	0.0	0.7	0.0	0.0
26	Russian Federation	53.5	65.2	1.0	0.2	0.6	0.5	0.1
27	Saint Kitts and Nevis	0.1	0.0	0.3	0.1	0.1	0.0	0.0
28	Saudi Arabia	12.5	8.0	1.3	0.5		0.2	0.0
29	Slovakia	2.2	2.4	3.9	0.7		0.1	0.0
30	Slovenia	0.9	0.9	1.8	0.4		0.0	0.0
31	Spain	19.6	20.3	0.4	0.2		0.1	0.0
32	Sweden	4.0	4.0	27.7	7.9		1.1	0.3
33	Switzerland	3.4	3.6	4.0	1.3	2.6	0.1	0.0
34	Trinidad and Tobago	0.5	0.5	0.5	0.3	0.4	0.0	0.0
35	United Kingdom	25.7	26.9	1.6	0.5		0.4	0.1
36	United States of America	127.9	134.2	7.1	0.4	3.6	9.1	0.5
37	Uruguay	1.3	1.4	0.0	0.0	0.0	0.0	0.0
Total		418.8	443.6			15.3	3.5	18.8

Percentage of estimated SLT users in developing countries (84 countries) 94.7%

Percentage of estimated SLT users in developed countries (37 countries) 5.3%

1. World Population Prospects: The 2012 Revision. New York: Population Division, Department of Economics and Social Affairs, United Nations Secretariat; 2013 (Refer reference 11 of the manuscript)

2. World Health Organization, World Health Statistics, 2014, WHO, Geneva, Switzerland. (Refer reference 12 of the manuscript)

By WHO region, there was wide variation in the number of SLT users (South-East Asia Region, 291.0 million [82.7%]; African Region, 14.5 million [4.1%]; Eastern Mediterranean Region, 15.6 million [4.4%]; European Region, 11.5 million [3.3%]; Region of the Americas, 11.8 million [3.4%]; and the Western Pacific Region, 7.6 million [2.2%]) (Fig. 1).

Ninety per cent of global SLT users live in 11 countries: India (237.4 million), Bangladesh (30.9 million), Myanmar (12.6 million), Pakistan (10.1 million), USA (9.6 million), China (4.1 million), Indonesia (3.2 million), Nepal (2.7 million),

Madagascar (2.6 million), Germany and Uzbekistan (2.4 million each) (Fig. 2).

The prevalence of SLT use among men ranged from 0% to 1% in 32 countries, 1.1–2% in 27 countries, 2.1–3% in 14 countries, 3.1–5% in 9 countries, 5.1–10% in 21 countries, and >10% in 17 countries. The prevalence of SLT use among women ranged from 0 to 1% in 67 countries, 1–2% in 16 countries, 2.1–3% in 10 countries, 3.1–5% in 9 countries, 5.1–10% in 6 countries, and >10% in 8 countries (Web Table 1; Web Figs. 3 and 4).

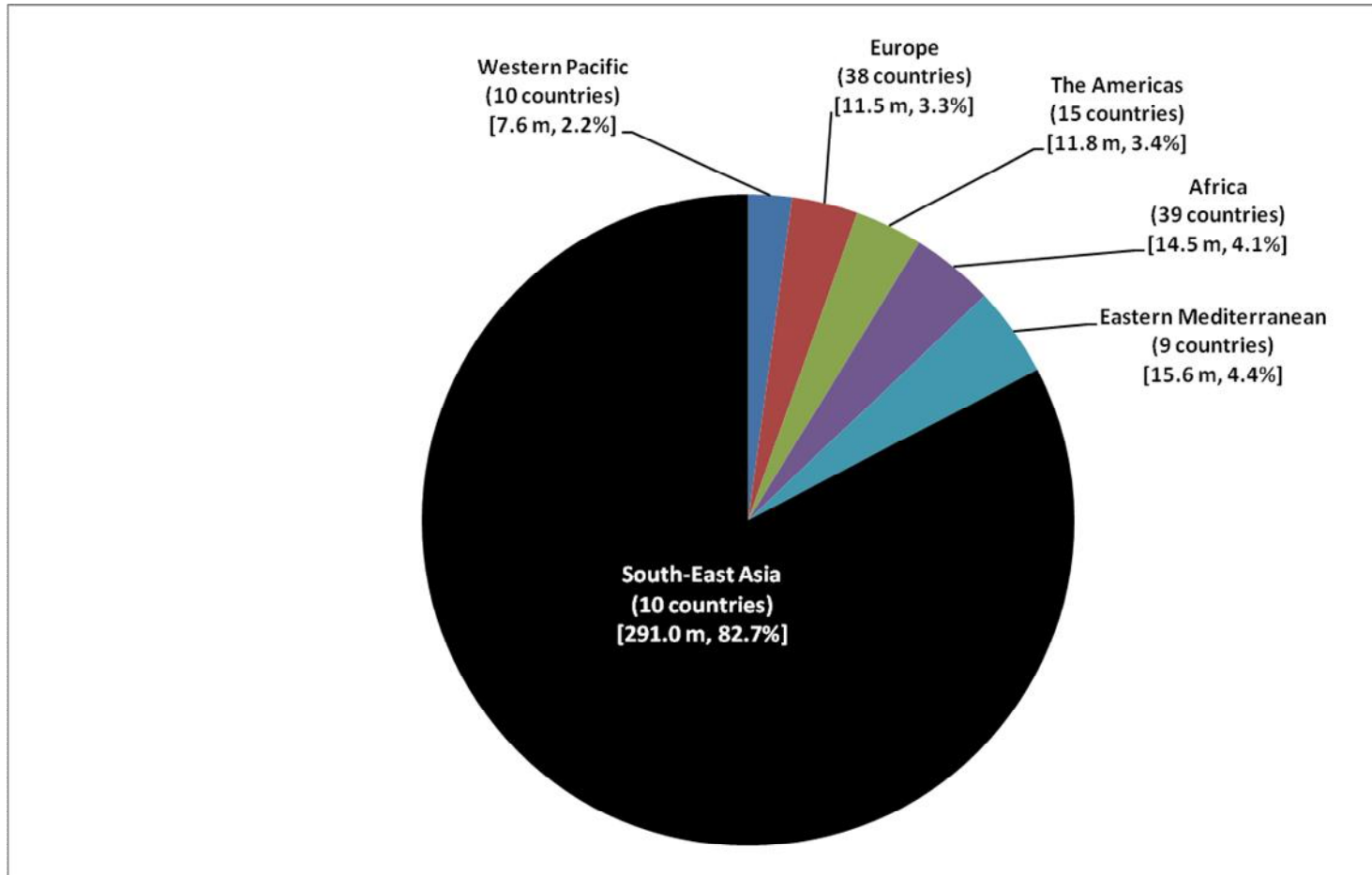


Fig. 1. Estimated SLT users (in millions) and proportion (percentage) of SLT users among adults in 121 countries by WHO region

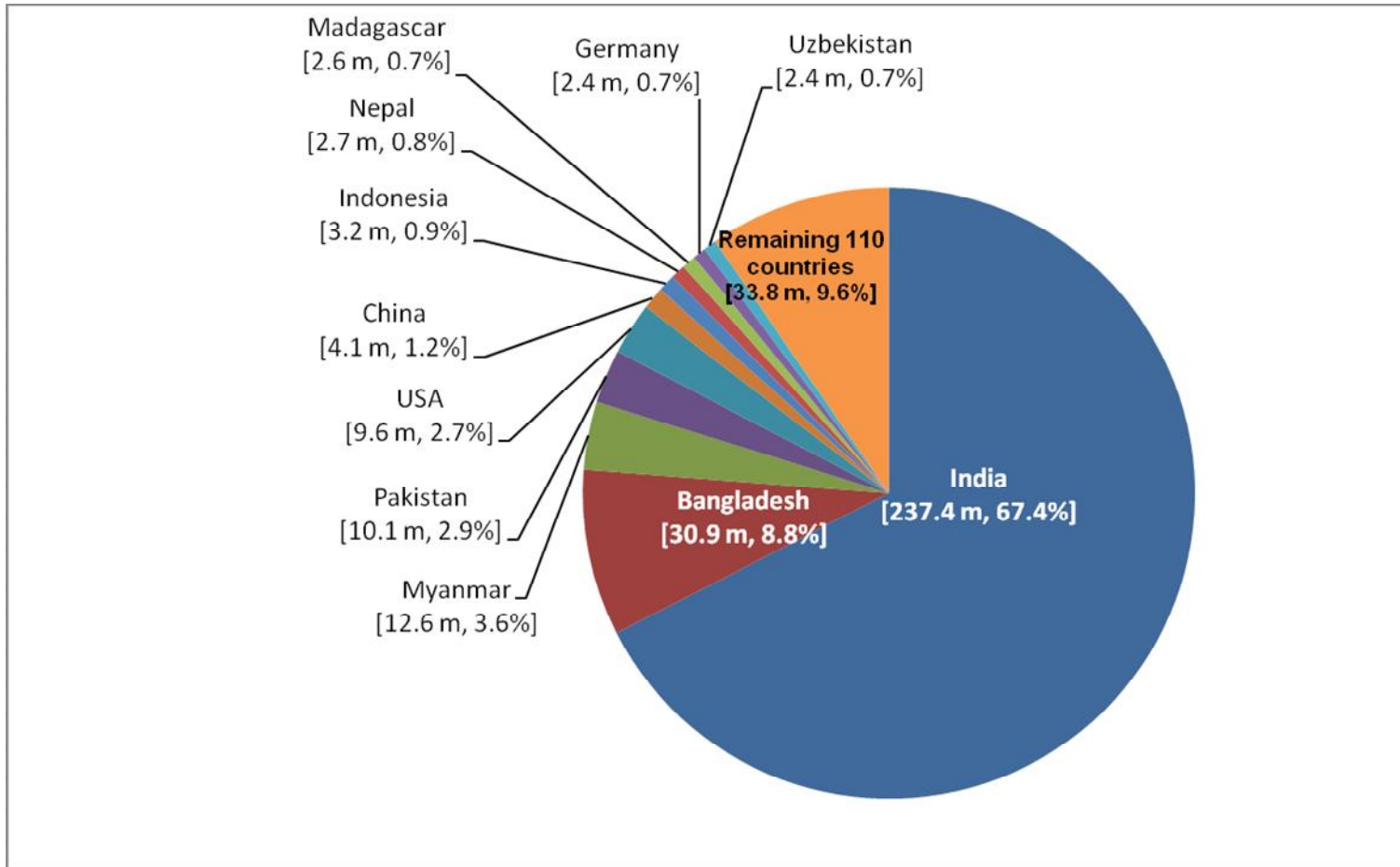
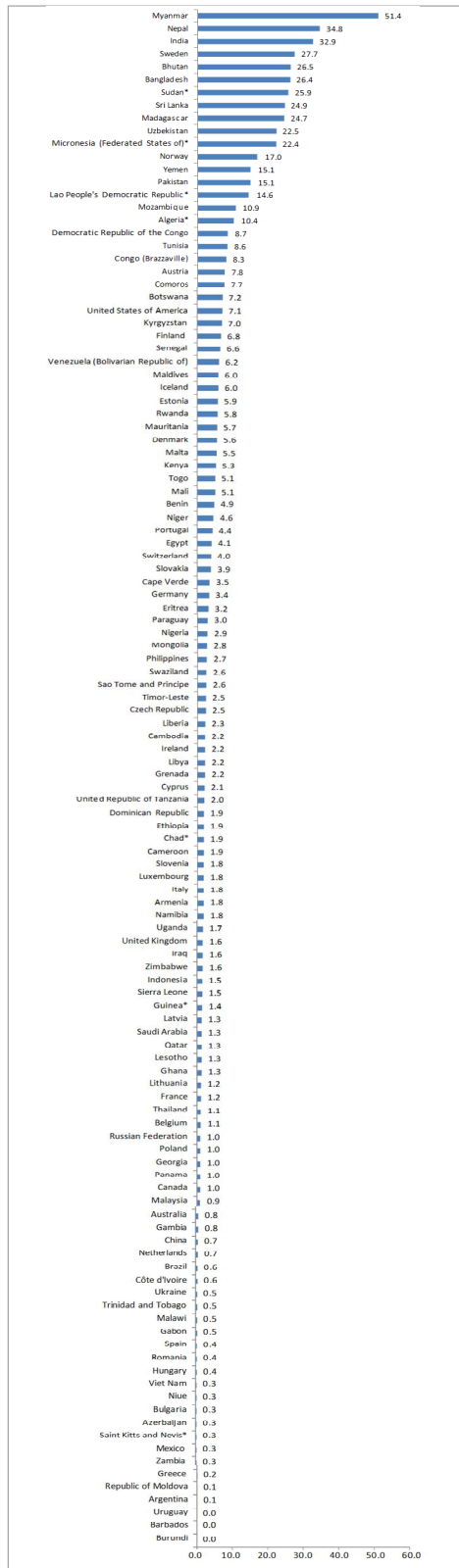


Fig. 2. Estimated number of SLT users (in millions) and proportion (percentage) of SLT users among adults, by countries



Web Fig. 3. Prevalence of smokeless tobacco use among males



Web Fig. 4. Prevalence of smokeless tobacco use among females

4. DISCUSSION

Our study provides updated information on the number of SLT users in the world, from the earlier estimate among 70 countries representing 70% of the global population in 2010 [1] to 121 countries, representing 88.1% of the global population in 2015. From 302.4 million in 2010, the number of SLT users rose to 352 million in 2015. Smokeless tobacco use is thus a global epidemic spread across 121 countries.

Our findings showed that the regional distribution of global SLT users has changed. The major change noted was in the South-East Asia Region, where the share of global SLT users decreased from 89% [1] to 83%, while in the rest of the world, it increased from 11% [1] to 17% (from 1% [1] to 4.4% in the Eastern Mediterranean Region, from 1.7% [1] to 3.3% in the European Region, and from 2.7% [1] to 4.1% in the African Region).

There is wide variation in the prevalence of SLT use both among men (from 0% in Uruguay, Barbados and Burundi to 51.4% in Myanmar) and among women (0% in Uruguay, Armenia, Bulgaria, Republic of Moldova, Ukraine and China to 28.3% in Mauritania). In countries where the prevalence of SLT use is high, more men than women were found to be SLT users with certain exceptions, such as in Bangladesh, Mauritania and Madagascar, where the prevalence among women is either higher than or comparable to that in men. This signifies that SLT use is socially acceptable among women in those countries.

One hundred and eighty countries have now ratified the WHO FCTC [13]. This international treaty clearly recommends control of all kinds of tobacco products. Article 1 of the WHO FCTC defines tobacco, which includes smokeless tobacco. Article 20 of the WHO FCTC provides guidance to countries on how to collect information on indicators related to all kinds of tobacco products [14]. Thus, countries that have ratified the WHO FCTC must include questions on smokeless tobacco use in their ongoing surveys. Comparability among countries in future may be increased by covering populations aged 15+ years, and by adapting standard Tobacco Questions for Surveys (TQS) [15] for smoked as well as for smokeless tobacco use.

Smokeless tobacco use causes oral, pharyngeal and oesophageal cancer, and heart diseases. Worldwide, the major burden of SLT use is in developing countries, especially those in the South-East Asia and African Regions. This results in greater health and economic losses in developing countries, where SLT contains more tobacco-specific N-nitrosamines (TSNAs) than in developed countries [1]. In India alone, 'all-cause SLT use-attributable mortality' has been estimated to be over 365 000 [16], the majority among women. Other developing countries with a high burden of SLT use still do not have any information on the health and economic losses attributable to SLT use. Such countries should make efforts to understand the magnitude of the problem and implement specific strategies to combat the menace within their scarce resources.

The estimates in this paper have certain limitations. (1) Surveys included in this study have not used similar methods and instruments. (2) The prevalence of SLT use taken for this study is for different years and not uniformly for 2015, and thus assumes that the prevalence has not changed over the years. Some of these data were available for the first time. In case two datasets were available, we used the latest data, or data covering a wider range of age groups. (3) In seven countries, subnational prevalence has been used in the absence of national prevalence estimates. (4) The number of SLT users reported is an underestimation as it represents the number of users aged 15+ years in 56 countries (73.8% of the global population), but underrepresents those in the remaining 65 countries (26.2% of the global population), where the prevalence has been estimated for a limited age range, such as those aged 15–64 years, 15–49 years and 25–64 years.

5. CONCLUSION

SLT use is a global epidemic spread across 121 countries. All countries that have ratified the WHO FCTC do not have basic information on the prevalence of SLT use. As an obligation of the Treaty, parties to the Convention should collect information on the prevalence of SLT use periodically using standard protocols by integrating TQS in ongoing surveys. The major burden of SLT use is in developing countries with scarce resources. Countries should plan specific strategies to protect their people from the menace of SLT use.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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