

SMOKELESS TOBACCO

Global Scenario and Health Impact

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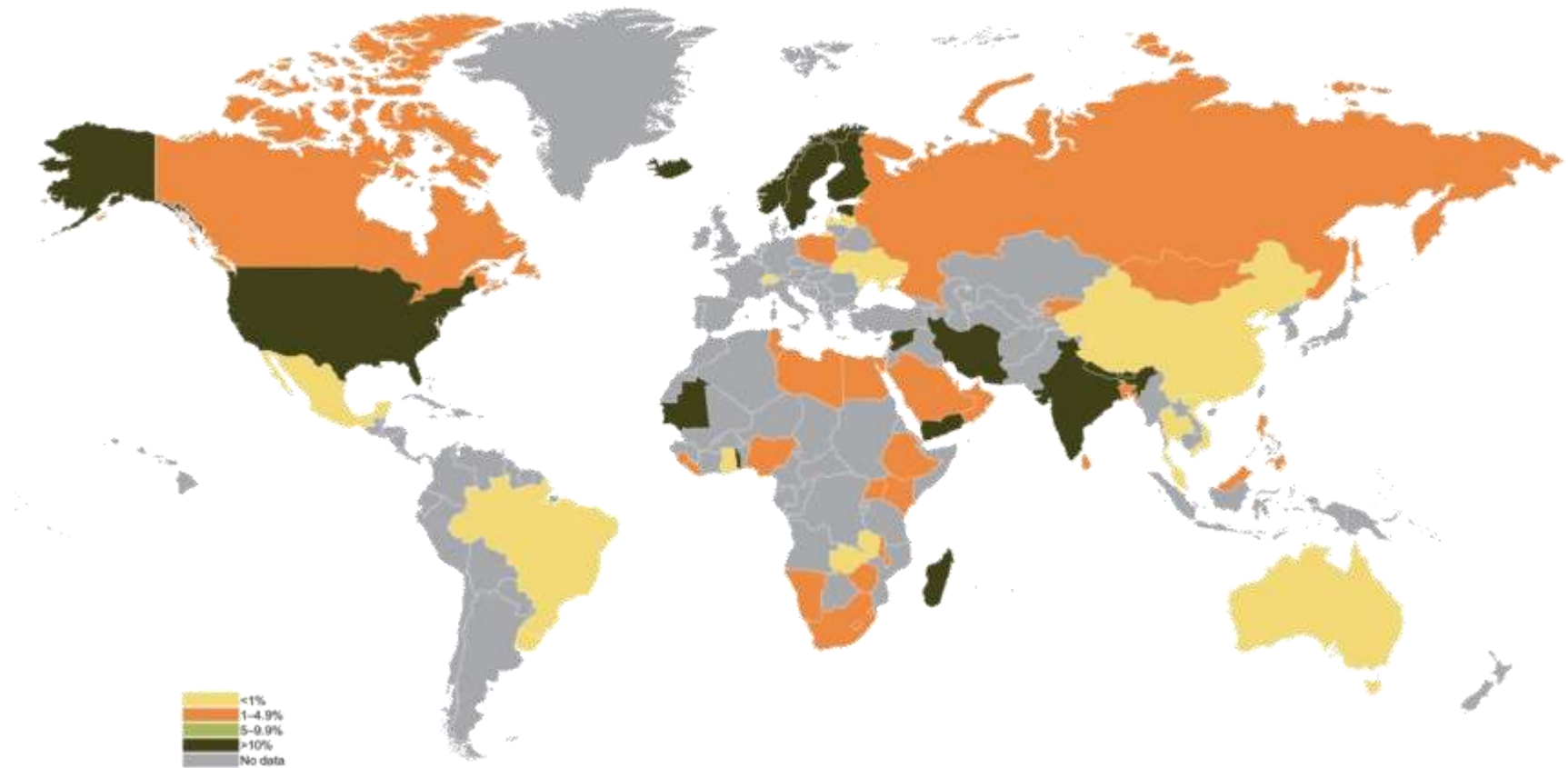
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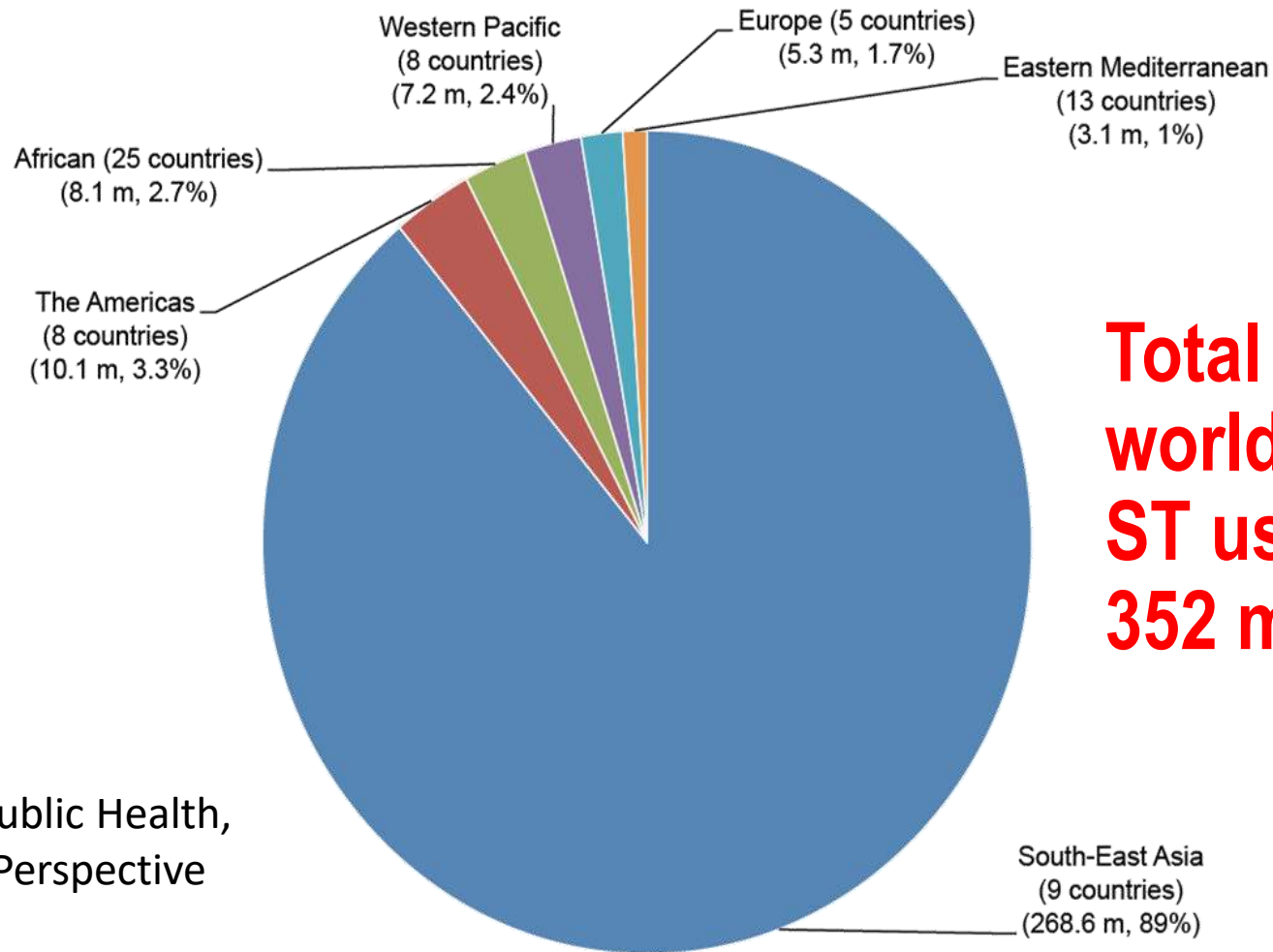
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ST: A Global Problem

ST affects approximately 352 million people in 121 countries



Number (Million) and Proportion (%) of Adult Smokeless Tobacco Users by WHO Region



**Total
worldwide
ST users =
352 million**

SLT & Public Health,
Global Perspective



Qiwam



Betel quid (paan)



Zarda



Gutka



Moist snuff



Dry snuff



Snus



Chimó



Moist snuff
(caffeinated)



Plug



Nasway



Toombak



Twist



Red tooth powder



Shammah



Orbs



Strips



Sticks



Tobacco-coated toothpicks



Mawa



Rapé

Modes of ST Use

- **Chewing** – contain tobacco leaves, other leaves (e.g., betel leaf), nuts (areca nut), other condiments
- **Sucking** – contain moist powdered tobacco with alkaline agents, e.g., snus, khaini, lozenges
- **Applying** – powdered or pasted products, e.g., mishri, bajjar, gudakhu, creamy snuff
- **Gargling** – tobacco water (tuibur)
- **Inhalation** – extremely fine dry powder, e.g., nasal snuff

India Situation

- India is the largest producer and consumer of SLT products
- There is a huge variety of SLT products
- As per latest GATS 2 results, there are still 200 million SLT users in India
- Annual deaths from SLT use in India among non-smokers were estimated as 368,127

(Sinha et al. Indian J Cancer 2014;51:73-7.)

Variety of Smokeless tobacco products in India



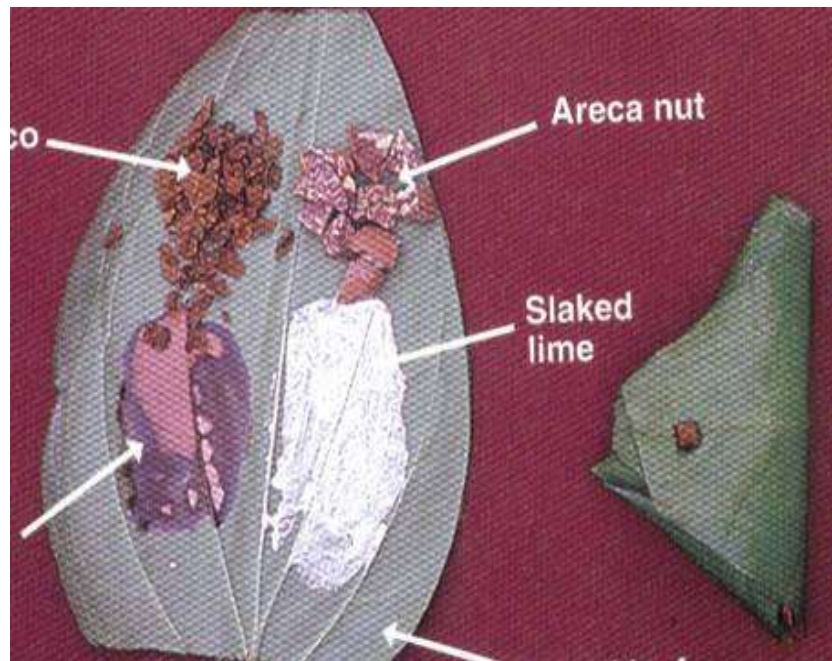
1. User prepared or assembled

- ❖ Although **tobacco leaves** can be chewed by themselves, the most common combination all over India is **tobacco and lime**. Tobacco in flake form can be purchased from most grocers. A user takes a pinch of tobacco adds a drop of lime (calcium hydroxide) mixes them vigorously using a thumb (or a finger) and the other palm, and putting it in the mouth (khaini). Some users add **areca nut** pieces as well.
- ❖ **Mishri** - Tobacco flakes are pyrolised on a hot plate till they get black and then powdered to form mishri. It is applied to teeth and gums



1. User prepared or assembled (continued...)

- **Betel quid** – Regular users keep all ingredients, green betel leaf, lime, areca nut tobacco and their favorite condiments available with them. They put all of them on the green betel leaf fold, and chew.



2. Custom made

- In any inhabited place in India, one cannot be too far from a kiosk selling tobacco products. They would prepare a betel quid as per user specification for quality and the type of ingredients. They can also prepare tobacco lime –areca nut mixture (mawa) or any specific combination of substances as per customer demand.



3. Manufactured (local and small scale)

- ❖ **Oral snuff** - dry tobacco powder marketed in small tins.
- ❖ **Mishri** - black powder of pyrolyzed tobacco marketed in small polythene bags
- ❖ **Gul** - oral moist snuff in small tins
- ❖ **Gudakhu** - tobacco paste with molasses in small bottles



3. Manufactured (local and small scale) continued...

- ❖ **Khaini** - tobacco-lime mixture in small polythene bags
- ❖ Some products are targeted mainly towards betel quid vendors
- ❖ **Kiwam** - paste of tobacco with aromatic substance in very small bottles.
- ❖ **Zarda, patti** - tobacco with saffron and other aromatic substances. Marketed in small aluminum foil sachets or tins



4. Manufactured (large industrial scale)

- **Gutka, pan masala** – tobacco, lime areca nut mixtures with sweetening and flavoring agents. Marketed in small colorful aluminum foil sachets with highly appealing brand names like Tulasi (basil leaf, offered to Lord in every Hindu worship and then eaten reverently by devotees); Sir (a universal form of address in India by students for their teachers) etc. Intense marketing and advertising campaigns in all media



Creamy Snuff (Tobacco toothpaste)



DENTOBAC

*“With all the goodness of natural **tobacco**, clove and mint”*

Background

- According to WHO, 7 million deaths annually are attributable to tobacco use globally, with most of its users living in low- and middle-income countries
- Deaths due to smoking comprise a major share of mortality
- However, trends in SLT use is rising over the years, hence SLT-attributable mortality is a matter of concern
- Any estimation of tobacco-related disease burden is incomplete without addressing the SLT component.

Key Findings

- Smokeless tobacco use is a global problem
 - Affects 352 million people across approximately 121 countries of all incomes
 - Majority of adult users live in low- and middle-income countries in SE Asia
 - In some countries, ST exceeds cigarette use
 - ST is a special problem among vulnerable populations such as youth, women and indigenous populations

- ▶ Two-third users are males (65.8%) and one-third are females (34.2%)
- ▶ Nearly one in ten adult males (10.4%) and one in twenty adult females (5.6%) use SLT
- ▶ More than 90% of global SLT users resides in LICs and LMICs
- ▶ SLT use is 1.2-8 times higher in rural areas as compared to urban in SEAR and AFR
- ▶ SLT use was 1.5-17 times higher among poor as compared to rich in SEAR and AFR

SLT Burden in South-east Asia

| Country | Year of survey | Adult user prevalence (%) | Year of survey | Adolescent user prevalence (%) |
|-------------|----------------|---------------------------|----------------|--------------------------------|
| Bangladesh | 2009 | 27.2 | 2007 | 4.9 |
| Bhutan | 2007 | 19.4 | 2009 | 9.4 |
| India | 2016 | 21.4 | 2009 | 9.0 |
| Maldives | 2009 | - | - | - |
| Myanmar | 2009 | 29.6 | 2007 | 6.5 |
| Nepal | 2008 | 18.6 | 2007 | 6.1 |
| Sri Lanka | 2006 | 15.8 | 2007 | 6.8 |
| Thailand | 2009 | 3.9 | 2009 | 5.7 |
| Timor Leste | 2009 | - | - | - |

Health Effects: Cancer

- ▶ More than 30 carcinogens have been identified
- ▶ Confirmatory evidence exists for oral, oesophageal and pancreatic cancer (IARC)
- ▶ Oral Potentially malignant lesions (PMDs) are common:
 1. **Leukoplakia:** malignant conversion rate: 0.1% - 17.5% (prevalence: 0.2% - 5.2%)
 2. **Erythroplakia:** malignant conversion rate: 14% - 49% (prevalence: 0.02% - 0.83%)
 3. **Oral submucous fibrosis (OSMF):** malignant conversion rate: 2.3% - 7.6% (prevalence: 0.03% - 6.42%)

Health Effects: Cardiovascular effects

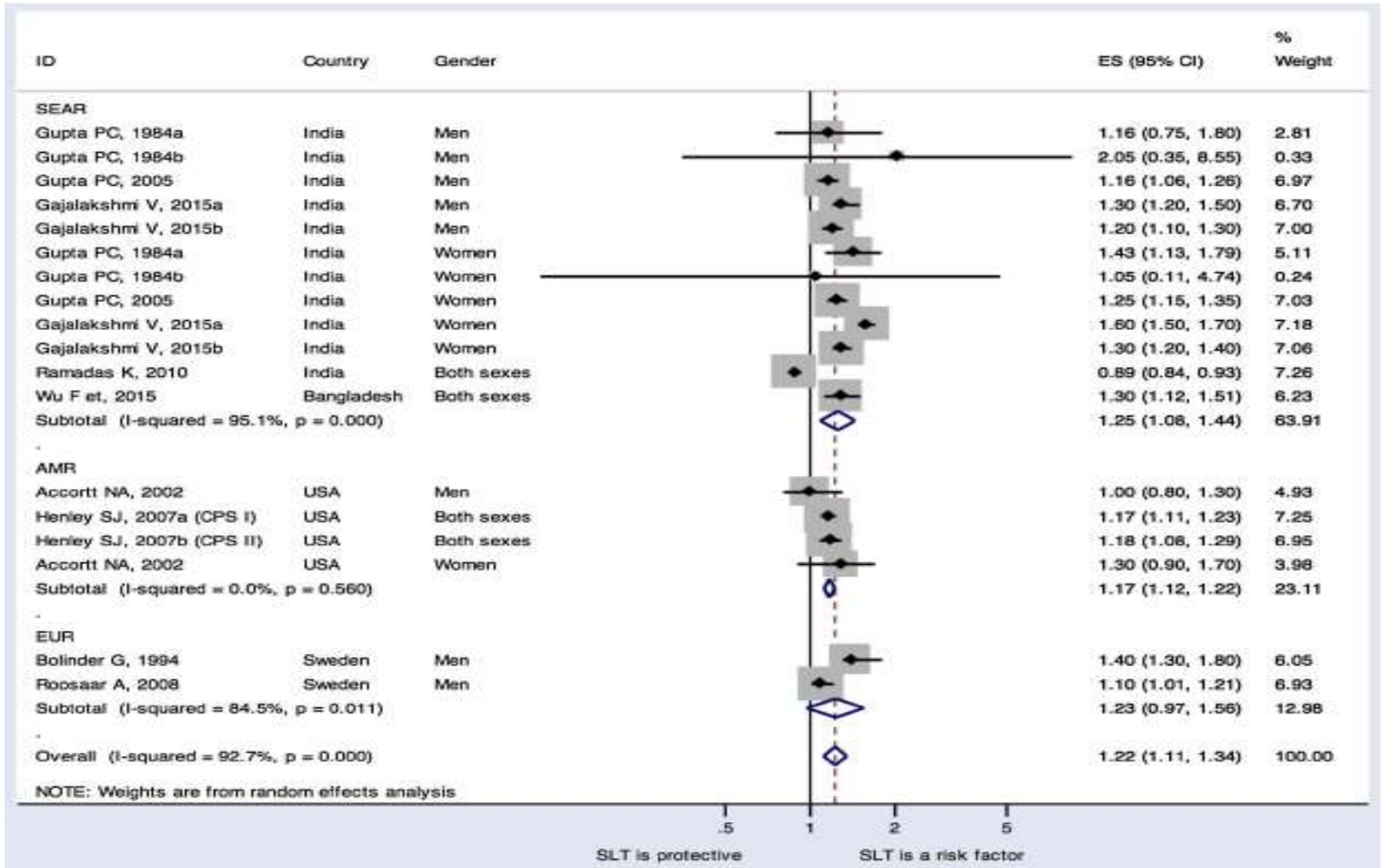
- ▶ The mechanism of CVS effects of SLT is similar to cigarettes
- ▶ **Heart Disease/ heart attack:** Could be related to nicotine, polycyclic aromatic hydrocarbons (PAH) and heavy metal in tobacco products
- ▶ **Hypertension:** several SLT constituents such as nicotine, sodium and licorice aggravate BP, especially diastolic BP.
- ▶ **Stroke:** SLT consumption is linked with increased risk of fatal ischemic heart disease and stroke (RR range from 1.1 in USA to 1.3 in Sweden)

Health Effects: Other conditions

- ▶ **Diabetes and insulin resistance:** particularly seen with heavy use of snus
- ▶ **Chronic rhinitis:** common with inhaled SLT products, such as dry snuff and Brazilian rapé
- ▶ **Reproductive outcomes:** due to PAHs and heavy metals
- ▶ **Psychological dependence:** severe if started at early age

- A significant association was found for mortality due to:
 - All cause (**1.22; 1.11–1.34**),
 - All cancer (**1.31; 1.16–1.47**),
 - UADT cancer (**2.17; 1.47–3.22**),
 - Stomach cancer (**1.33; 1.12–1.59**),
 - Cervical cancer (**2.07; 1.64–2.61**),
 - IHD (**1.10; 1.04–1.17**) and
 - Stroke (**1.37; 1.24–1.51**).
- Significant differences were also seen among WHO regions.

Forest plot for the meta-analysis of All-Cause mortality



Deaths

- Globally, the number of deaths that could be attributed to SLT, due to all causes, was 652,494 (234,008–1,081,437) (more than 6.5 lakhs).
- The SEAR bore the major proportion (88%) of this burden
- The highest burden was due to stroke mortality, followed closely by all-cancer mortality
- The proportion of deaths was higher among women for all cause, all cancer and IHD, in majority of the regions

DALY (Disability Adjusted Life-Years)

- The attributable DALYs were estimated to be 45.9 million due to all causes and a major share (80%) of it was borne by the SEAR.
- The burden due to cause-specific outcomes was majorly for all-cancer and stroke.
- Also, proportion of DALYs was higher among women for all cause, all cancer and IHD.

- The process of recognizing SLT as an important component of the global tobacco control efforts has been slow and laborious.
- However, SLT may be the single largest risk factor for intervention in the prevention of about 650,000 deaths, which is nearly 10% of all tobacco-attributable deaths.

Mortality estimates for India

- Another random effects meta-analysis deriving population attributable fraction was used to estimate attributable deaths in persons in India aged 35 years and older. The analysis was adjusted for smoking, age and education.
- Observed RRs for females and males were 1.34 (1.27–1.42) and 1.17 (1.05–1.42) respectively.

Sinha DN, Palipudi KM, Gupta PC, Singhal S, Ramasundarahettige R, Jha P, *et al.* *Smokeless tobacco use: A meta-analysis of risk and attributable mortality estimates for India.* Indian J Cancer 2014;51:73-7.

- The number of deaths attributable to SLT use in India is estimated to be 368,127 (217,076 women and 151,051 men), with nearly three-fifth (60%) of these deaths occurring among women.
- These estimates calls for targeted public health intervention in India focusing on SLT products especially among women.

Table 3: SLT use-attributable mortality in India, 2008

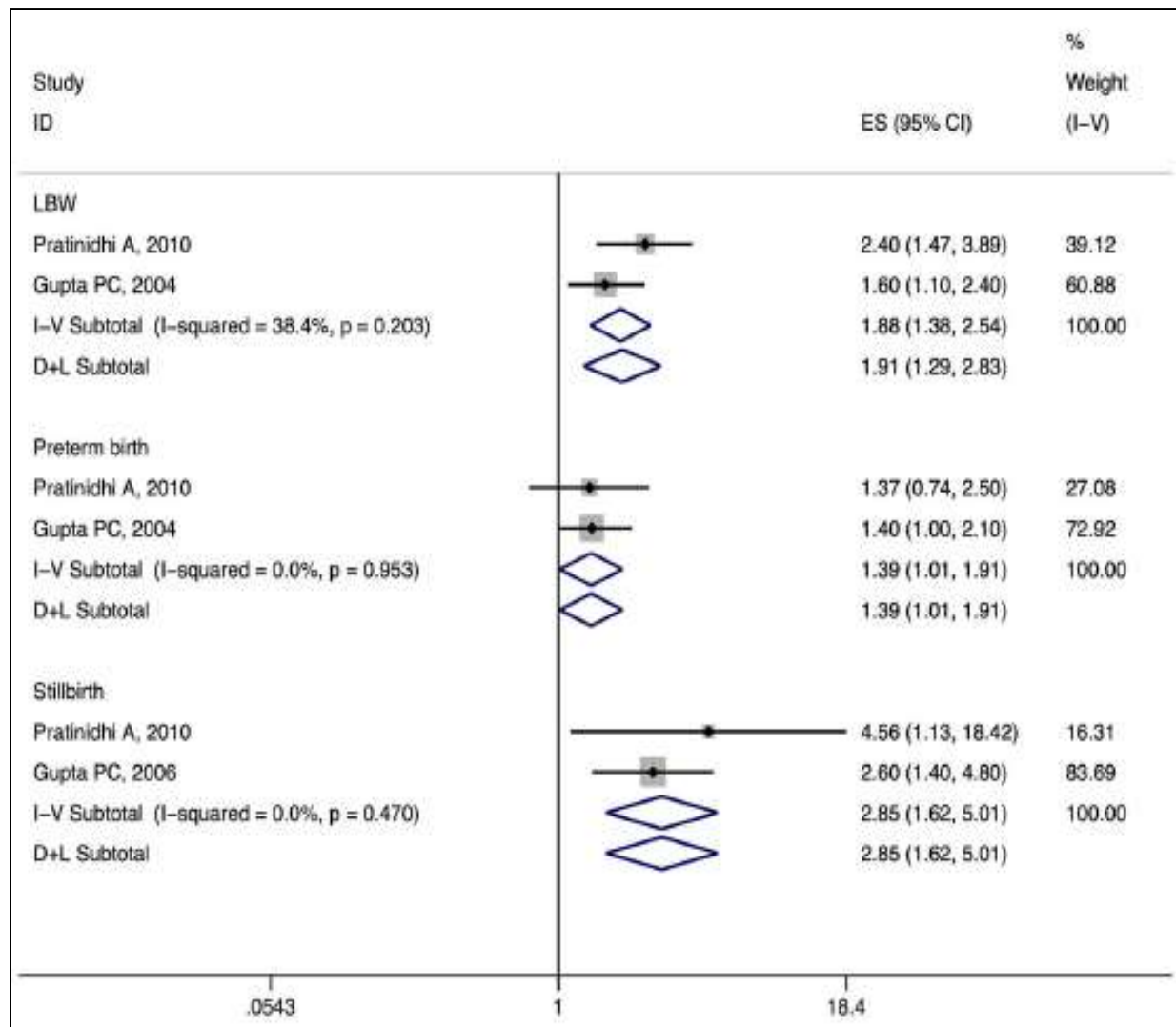
| | 2006-2009 prevalence of SLT (current users) in age 35+ ^a | RR of death for age 35+ | $P (RR-1)$ | $PAF = P (RR-1) / (P [RR-1] + 1)$ | Deaths attributable to SLT use | 2008 total deaths in the 35+ ('000) |
|--------|--|----------------------------|------------|-----------------------------------|-----------------------------------|--|
| Male | 0.252 | 1.17 | 0.04284 | 0.04108 | 151,051 | 3677.0 |
| Female | 0.245 | 1.34 | 0.08806 | 0.0789 | 217,076 | 2823.2 |
| Total | | | | | 368,127 | 6500.2 |

SLT=Smokeless tobacco; RR=Relative risk; PAF=Population attributable fraction

Neonatal Mortality estimates due to SLT use in India

- A similar meta-analysis analyzing the available evidence on the association between SLT use and three adverse pregnancy outcomes was conducted among women in India:
 - **low birth weight (LBW),**
 - **preterm birth and**
 - **stillbirth.**
- Results showed that pooled odds ratio was significant for all three outcomes: LBW (1.88, 95%CI 1.38, 2.54), preterm birth (1.39: 1.01, 1.91) and stillbirth (2.85: 1.62, 5.01).

- It was estimated that:
 - 0.87 million LBW babies,**
 - 0.19 million preterm births and**
 - 0.12 million stillbirths**
- occurring annually in India could be attributed to maternal SLT use.



Suliankatchi RA, Sinha DN. The Human Cost of Tobacco Chewing Among Pregnant Women in India: A Systematic Review and Meta-analysis. The Journal of Obstetrics and Gynecology of India, 2016. DOI 10.1007/s13224-015-0821-7

Conclusion and Recommendations

- Majority of Studies provide sufficient evidence to suspect the role of SLT use in tobacco-attributable mortality.
- It is widely recognized that the tobacco control activities have ignored the SLT component.
- With these robust estimates, policy makers could be convinced to divert some of their attention to this growing problem.
- With a major burden in South-east Asia, and high mortality ratio in females, the fight against tobacco becomes even more important.

Challenges

- ST is not considered a priority in the tobacco control arena
- Limited data to help develop policies and programs (e.g., pricing, sale of ST products, impact on household economics, health effects and costs)
- Diversity of products
- Emergence of novel products in the market
- Lack of knowledge about the harms of ST
- Strong advocates for ST harm reduction, which will not be viable in all countries

Thank You
for
Your Attention