SMOKING, HEALTHCARE COST AND LOSS OF PRODUCTIVITY IN INDONESIA 2010

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1. Introduction

1.1 Background of the Study

1.2 Research Question

1.3 Significance of the Study

1.4 Research Objective

1.5 Research Hypothesis

1.6 Scope of the Study

1.1 Background of the Study

- According to WHO´s projection, in 2020 tobacco-related illnesses will become the largest single health problem, causing an estimated 8.4 million deaths globally per year.
- Indonesian Global Adult Tobacco Survey report of 2011 showed that 67.4% of men and 4.5% of women comprising 36.1% of the population (61.4 million) used tobacco in smoked or smokeless form.
- Indonesians consume the fifth largest amount of tobacco globally in 2002.

- Indonesian National Survey in 2009 showed that 62% of men and 1% 3% of women are smokers.
- Studies on smoking cost estimate in Indonesia is limited
- Indonesia was being the only Asian country out of 41 countries attending the Asia Pacific Conference on Tobacco or Health (APACT) not to have signed the World Health Organization’s Framework Convention on Tobacco Control (FCTC)

1.2 Research Question

How much were healthcare costs and loss of productivity due to smoking in Indonesia in 2010?

1.3 Significance of the Study

Empower people and the government on tobacco control advocacy

1.4 Research Objective

To estimate healthcare cost and loss of productivity due to smoking in Indonesia 2010

1.5 Research Hypothesis

Smoking can cause smoking-attributable expenditure related to smoking attributable diseases and deaths.

1.6 Scope of the Study

Health care cost (direct cost) and productivity losses (indirect cost) duet to smoking are calculated. Healthcare cost includes inpatient services, outpatient services, and prescription drugs. Indirect cost includes productivity losses due to illness and premature death.

3. RESEARCH METHODOLOGY

- Prevalence-based approach
- Private perspective

3.1 Source of Data

3.2 Direct Cost

3.3 Indirect Cost

3.4 Type of Diseases

3.5 Data Analyses

3.1 Source of Data

- 2007 BHR (Baseline Health Research
- 2010 BHR
- 2010 NSS (National Socioeconomic Survey)
- Population Census of 2010
- Report of Annual Gross National Income of 2010
- Report of Labor Participation Rate

3.2 Direct Cost

3.2.1 ESTIMATING HEALTHCARE EXPENDITURE OF 2010

Healthcare expenditure are determined according to data of 2010 BHR (Baseline Health Research) and 2010 NSS (National Socioeconomic Survey). The average of per person health expenditure are calculated according to age groups (20-34, 35-64 and >= 65) for the 2010 BHR and the 2010 NSS, respectively. An average of the results gained from the two database was calculated and applied to population census data of 2010 according to the age groups.

3.2.2 ESTIMATING THE SAF (SMOKING ATTRIBUTABLE FRACTION)

$RR_c = r_c/rn$ and $RR_f = r_f / r_n$

where r_c = rate of illness or death for current smokers

r_f = rate of illness or death for former smokers

r_n = rate of illness or death for never smokers

RR_c = relative risk for current smokers relative to never smokers

RR_f= relative risk for former smokers relative to never smokers

$$SAF = \frac{[(p_n + p_c(RR_c) + p_f(RR_f)] - 1}{[(p_n + p_c(RR_c) + p_f(RR_f)]}$$

where p_n = percentage of never smokers in the region

p_c = percentage of current smokers in the region

p_f = percentage of former smokers in the region

Rr_c = relative risk for current smokers relative to never smokers

Rr_f = relative risk for former smokers relative to never smokers

3.2.3 ESTIMATING SMOKING ATTRIBUTABLE EXPENDITURES

Smoking-attributable expenditures are estimated for each disease, for males and females, and for each age groups. Once the SAFs are obtained they are multiplied by the corresponding health care expenditure.

3.3 Indirect Cost

3.3.1 LOST PRODUCTIVITY DUE TO ILLNESS

.3.1.1 Estimating work loss days

Work loss days in this paper is defined as the length of stay in ealthcare services. First, the average annual length of stay for inpatient ervices per adult aged 20 and older in Indonesia were estimated by ales and females (separately) and by 20-34, 35-64 and age groups, sing the 2010 NSS data. Second, these average days were multiplied y Indonesian population based on 2010 census to derive the total days pent in inpatient care in 2010.

3.3.1.2 Estimating SAF

The same with direct cost

3.3.1.3 Estimating Smoking Attributable Work Loss Days

The SAF for days lost is applied to the total number of days lost to obtain smoking-attributable days of lost productivity. Work loss days are divided by 365 days (1 year) and are valued using Indonesian Gross National Income (GNI) of 2010.

3.3.2 LOST OF PRODUCTIVITY DUE TO PREMATURE DEATHS

3.3.2.1 DEATHS ATTRIBUTED TO SMOKING

The SAF for each age group, gender, and disease is applied to the corresponding number of deaths to determine the number of smoking attributable deaths. The SAF is determined according to the formula presented previously using the relative risk of death published by the Surgeon General (US DHHS 1989) and the 2010 smoking prevalence in Indonesia . Deaths for each smoking-related diagnosis was obtained from the 2007 BHR mortality data.

3.3.2.2 YEARS OF POTENTIAL LIFE LOST (YPLL)

YPLL is the number of years people would have, had they not died of smoking-related disease. The number of years lost is estimated as the average number of years of life expectancy remaining at the age of death. Thus, smoking-related deaths (by gender and 3 age groups) are multiplied by the number of years of life expectancy remaining. The data of life expectancy was obtained from CIA Worldfact book of 2010

Thus: Smoking-attributable YPLL = deaths x SAF x YPLL

3.3.2.3 ESTIMATION OF THE VALUE OF SMOKING-ATTRIBUTABLE LOST PRODUCTIVITY FROM PREMATURE DEATH

The cost to society of smoking-attributable mortality is calculated as the product of the number of deaths and the present value of lifetime earnings (PVLE) for each person. This calculation takes into account labor market earnings by using GNI as proxy and the probability that a person will be in the labor market for each age group and gender. GNI of 2010 is obtained by projecting the GNI of the previous 10 years (since 2000)

Present Value of Life Earnings

The PVLE is calculated as:

$$PVLE = \sum_{n=y}^{99} P_{y,g}(n)\,[Y_g(n)\,E_g(n)] * (1+p)^{n-y} / (1+r)^{n-y}$$

where PVLE is the present discounted value of lifetime earnings per person

$P_{y,s}(n)$ is the probability that a person of gender g will survive to age n

y is the age of the person at death

g is the gender of the individual

n is the age of the person

Yg(n) is the mean annual earnings of an employed person of gender g and age n. In this paper, due to lack of data GNI is used as a proxy for all gender and age groups.

Eg(n) is the proportion of the population of gender g and age n that are employed in the labor market

p is the rate of increase of labor productivity

r is the real discount rate

3.4 Type of Diseases

Heart Disease and Neoplasm

3.5 Data Analysis

All of the calculation and descriptive analysis done in this paper use 16th Version of SPSS and Microsof Excel of Windows7.

4. RESULT AND DISCUSSION

4.1 Prevalence of Smoking In Indonesia 2010

4.2 Smoking Attributable Fraction

4.3 The Direct Cost of Smoking in Indonesia 2010

4.4 The Morbidity Cost /Loss of Productivity due to Illness in Indonesia 2010

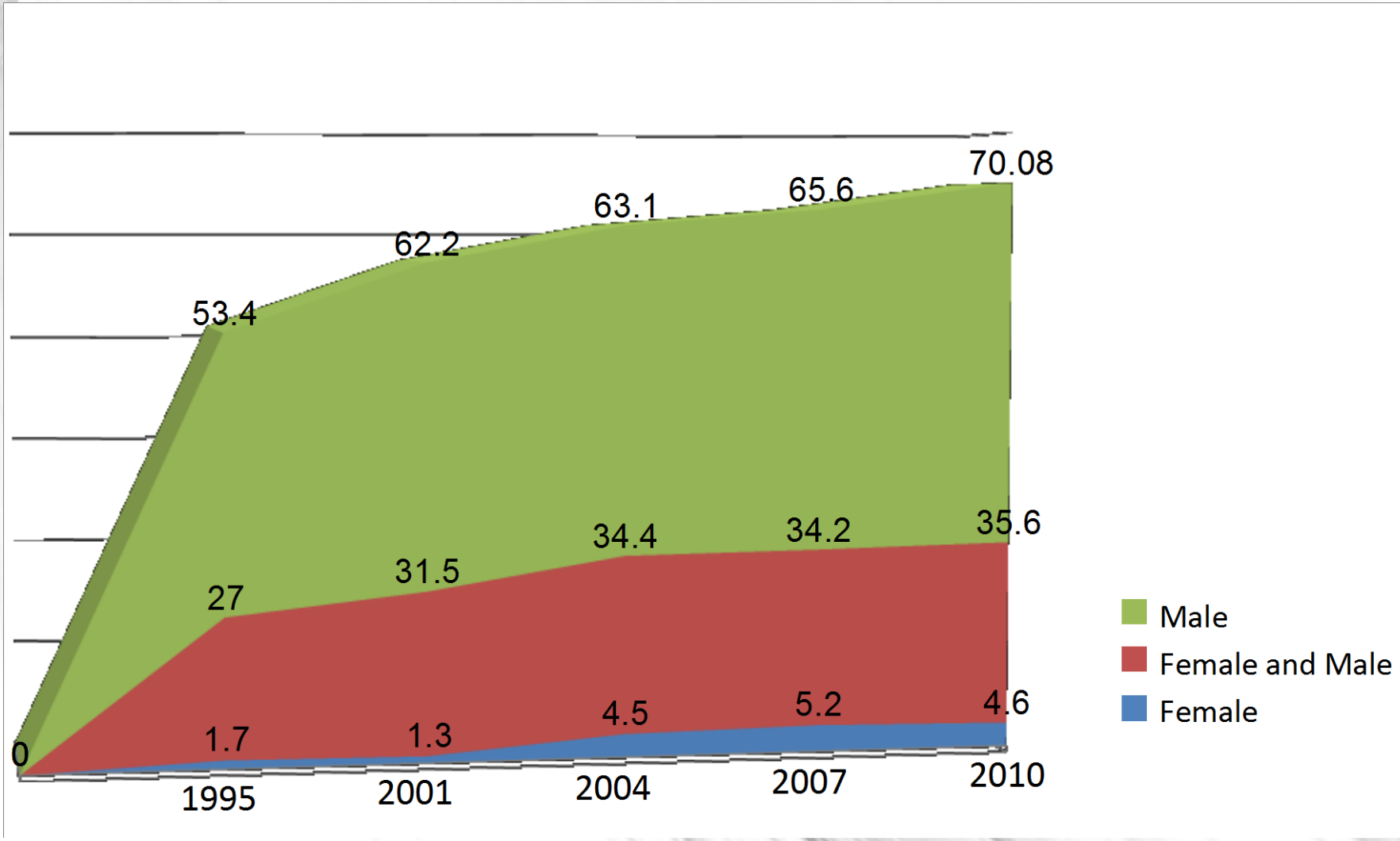
4.5 The Smoking-Attributable Deaths Estimate in Indonesia 2010

4.6 The Mortality Cost/Loss of Productivity due to Premature Deaths in Indonesia 2010

4.7 The Cost of Smoking in Indonesia 2010

4.1 Prevalence of Smoking In Indonesia 2010

Table 6. Smoking Prevalence of People Aged 15 Years and Older by Gender, Indonesia (in %)



4.2 Smoking Attributable Fraction

Table 10. Smoking Attributable Fraction (SAF) of the Morbidity, Indonesia, 2010

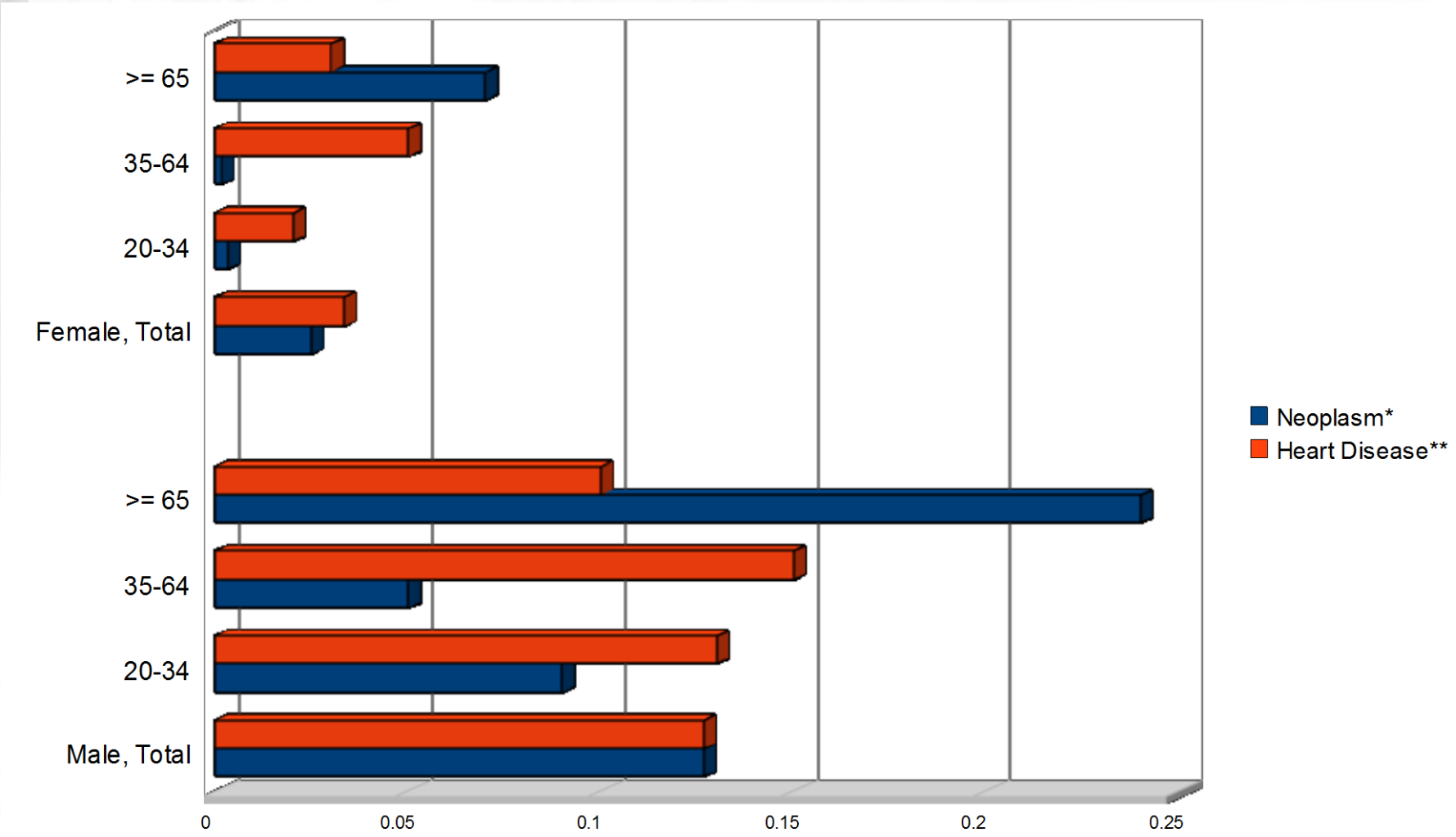
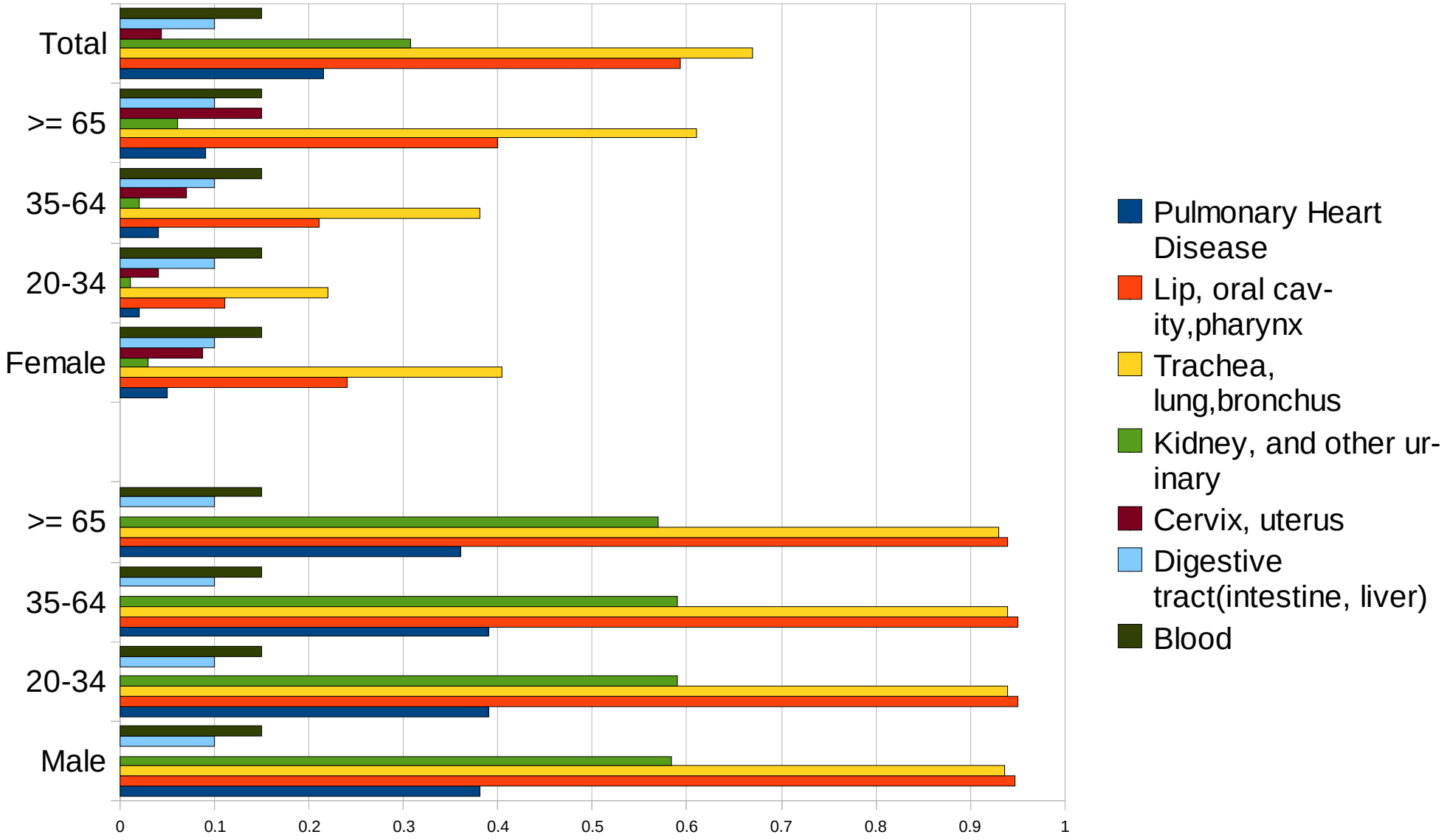
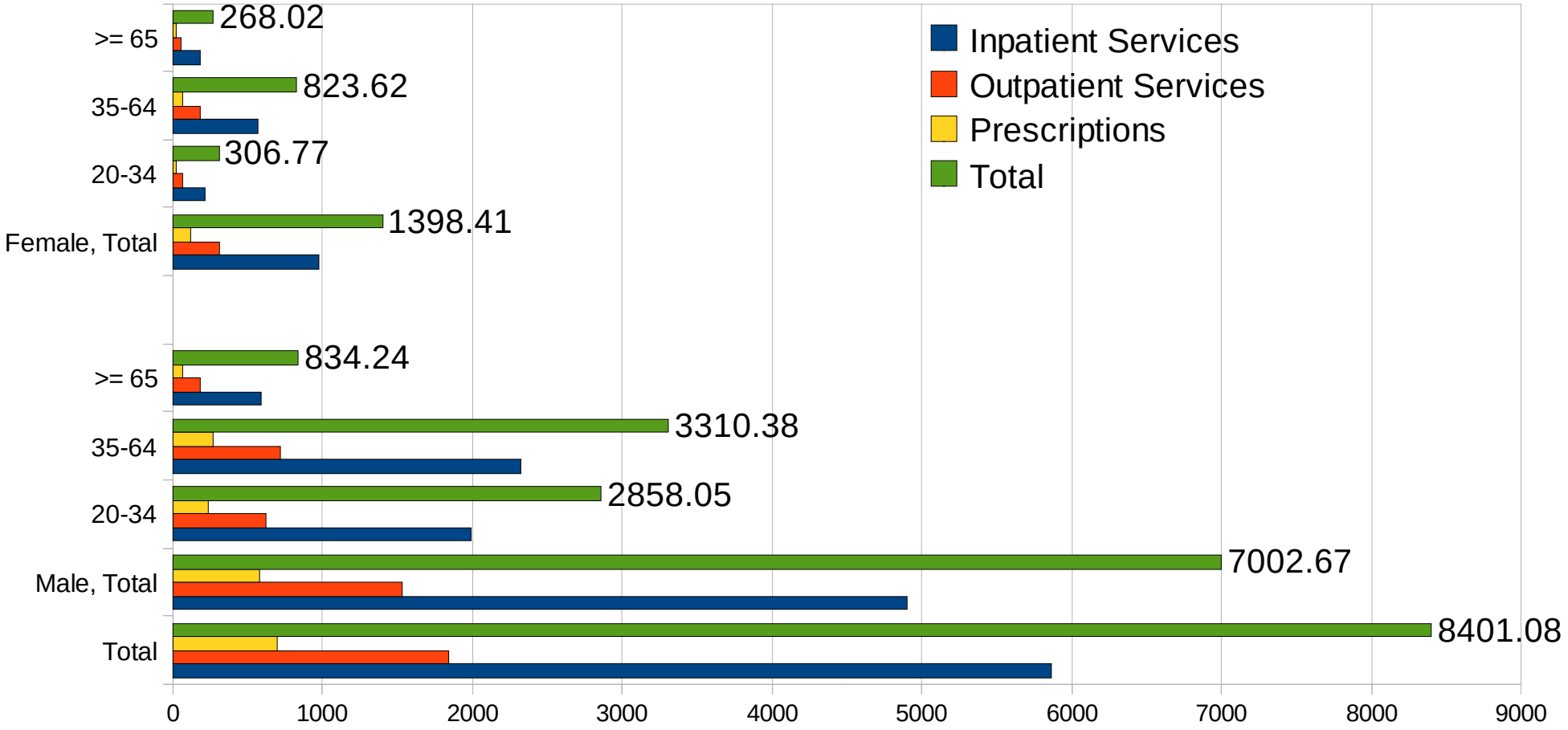


Table 11. Smoking Attributable Fraction (SAF) of the Mortality, Indonesia, 2010



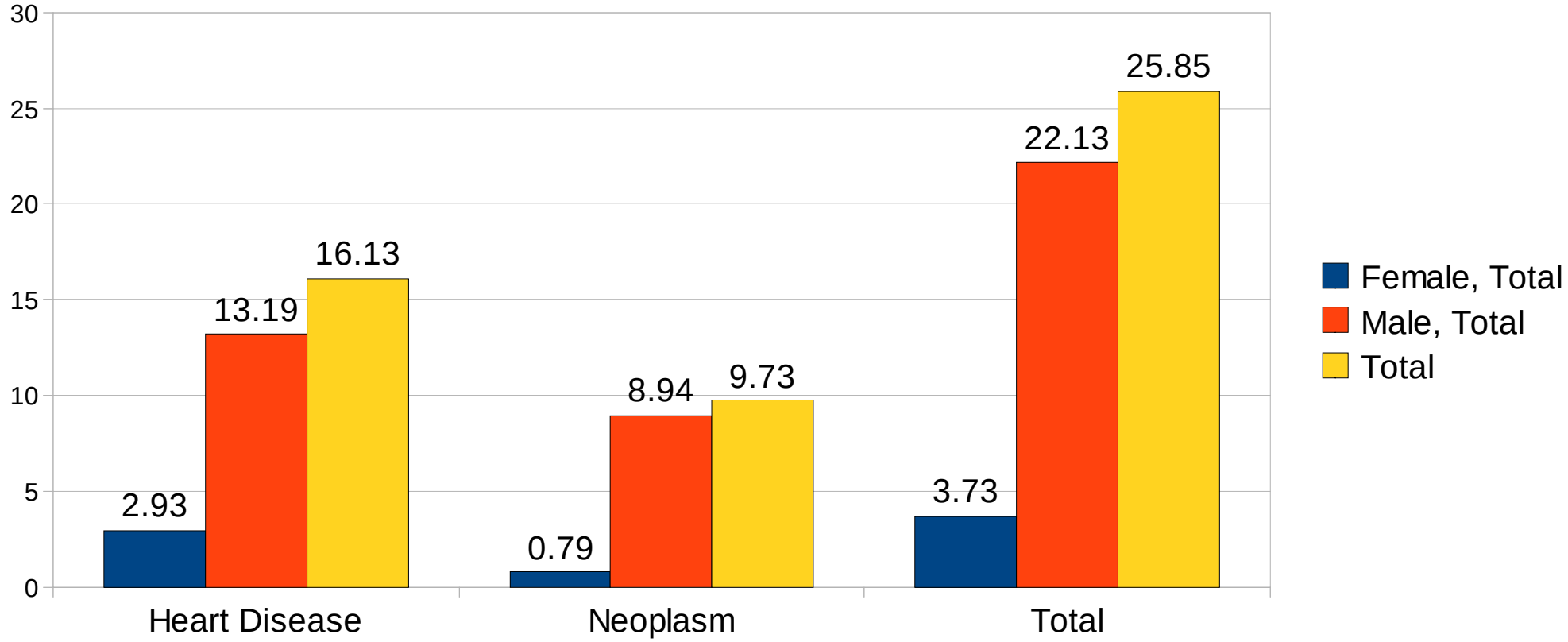
4.3 The Direct Cost of Smoking in Indonesia 2010

Table 12. Direct Cost of Smoking by Gender, Age and Type of Expenditure, Indonesia, 2010 (in Billion Rp.)

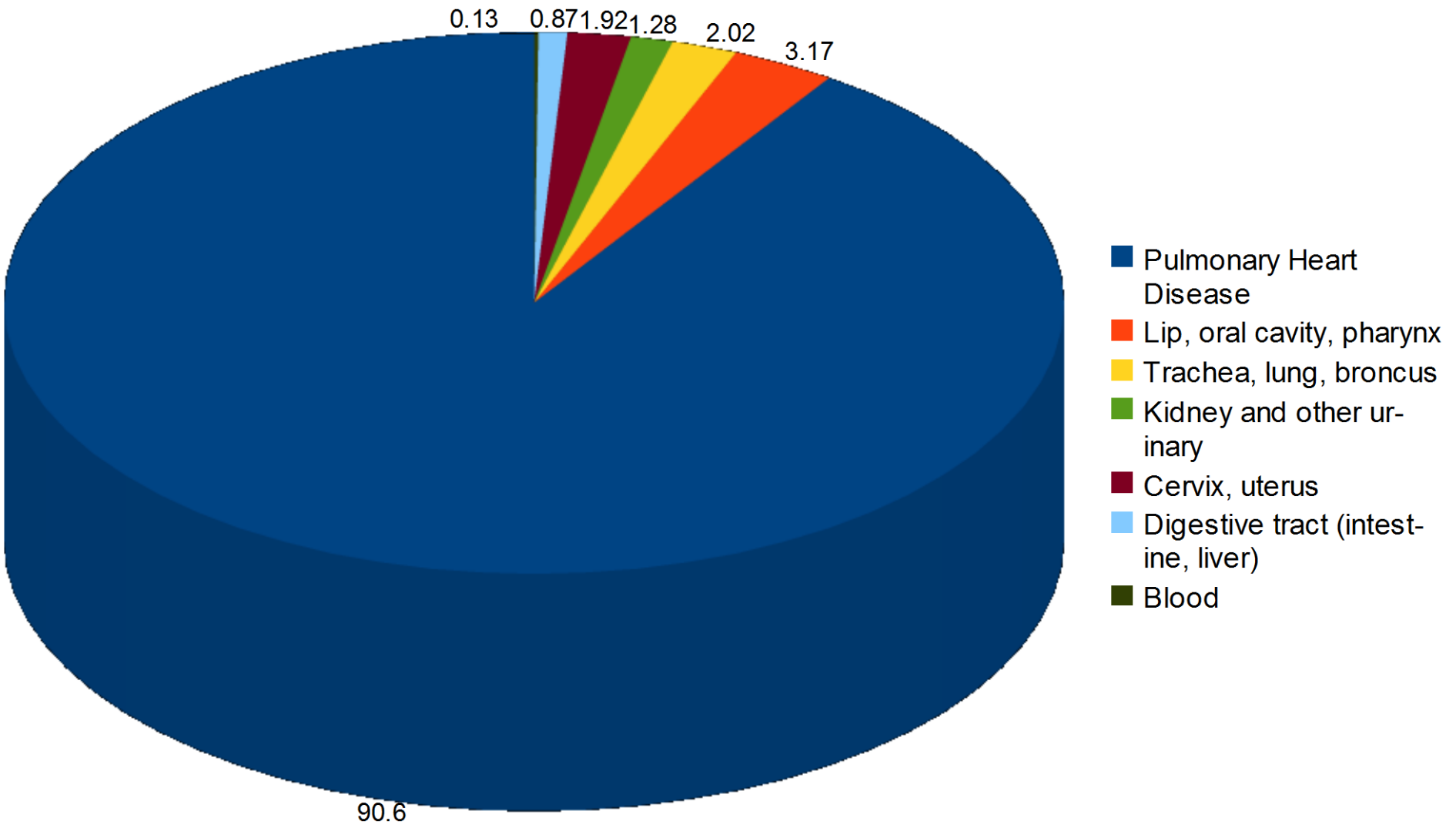


4.4 The Morbidity Cost /Loss of Productivity due to Illness in Indonesia 2010

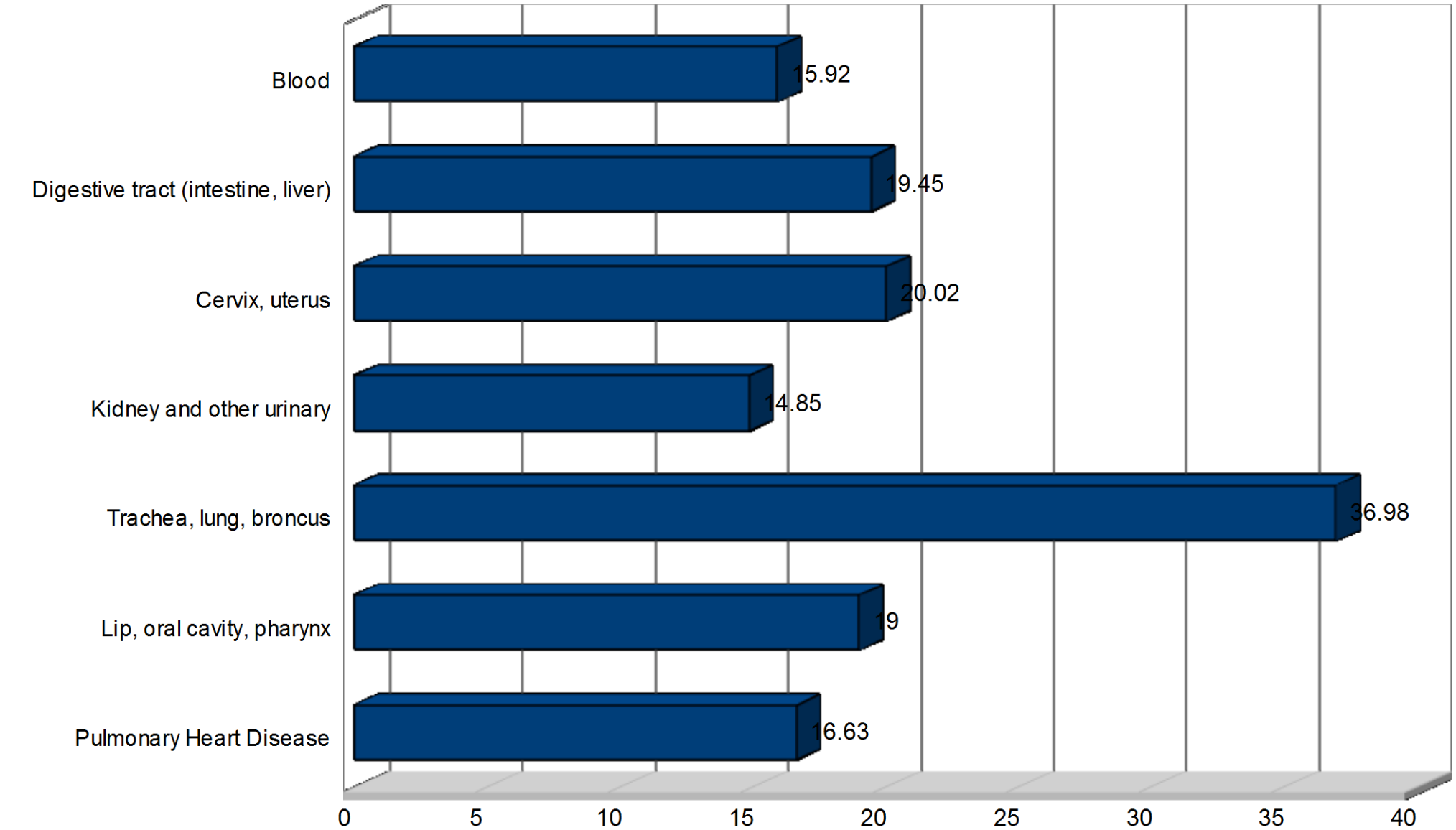
Table 14.Days Lost and Productivity Losses Attributed to Smoking by Gender and Cause of Hospitalization, Indonesi 2010 (in Billion Rp.)



4.5 The Smoking-Attributable Deaths Estimate in Indonesia 2010

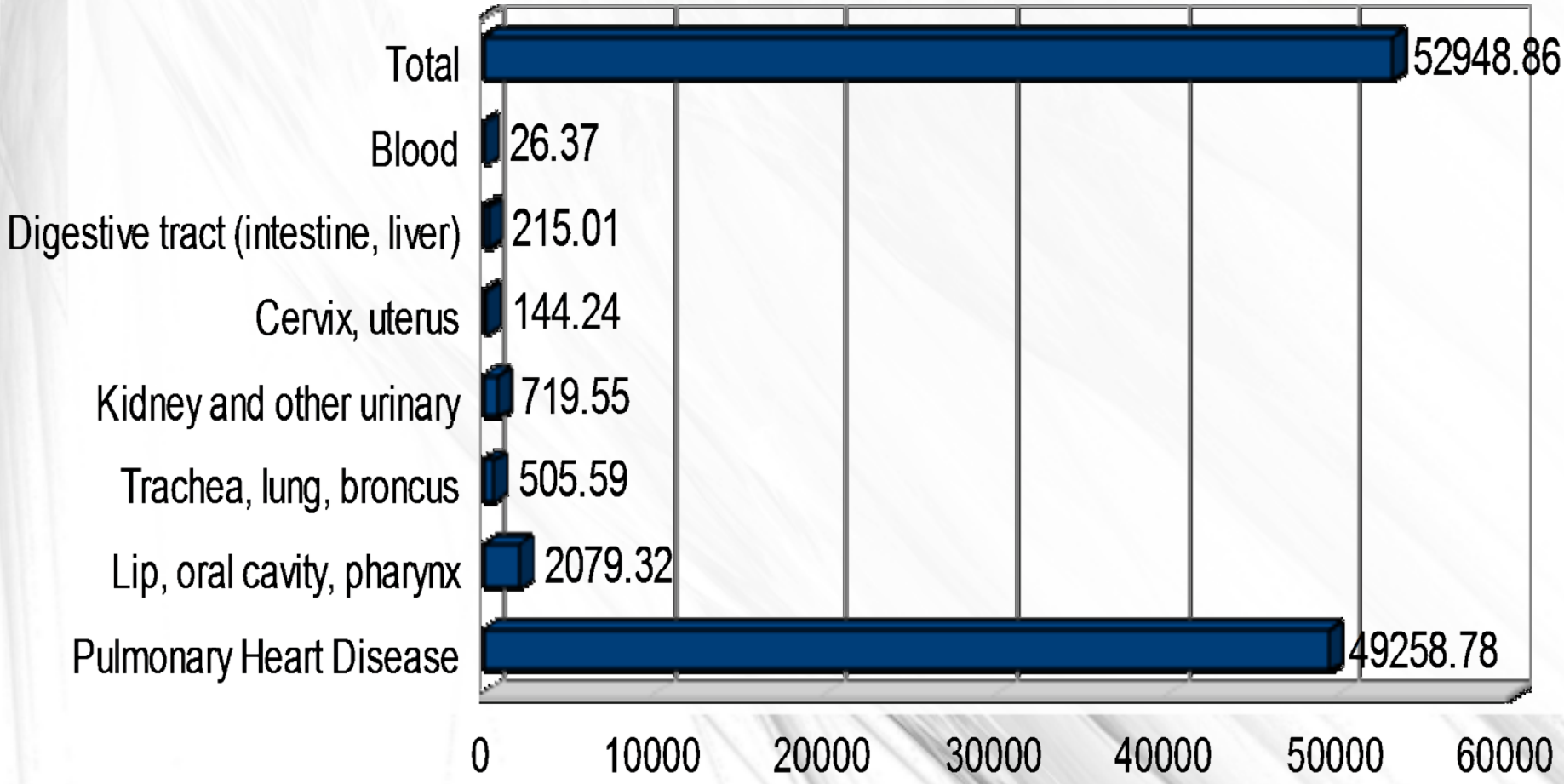


Years of Potential Life Lost per Death (in years)



4.6 The Mortality Cost/Loss of Productivity due to Premature Deaths in Indonesia 2010

Table 21. Deaths, Years of Potential Life Lost, and Productivity Losses Attributed to Smoking, Indonesia, 2010 (In Billion Rp.)



4.7 The Cost of Smoking in Indonesia 2010

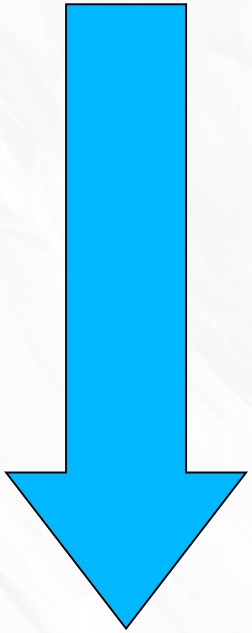
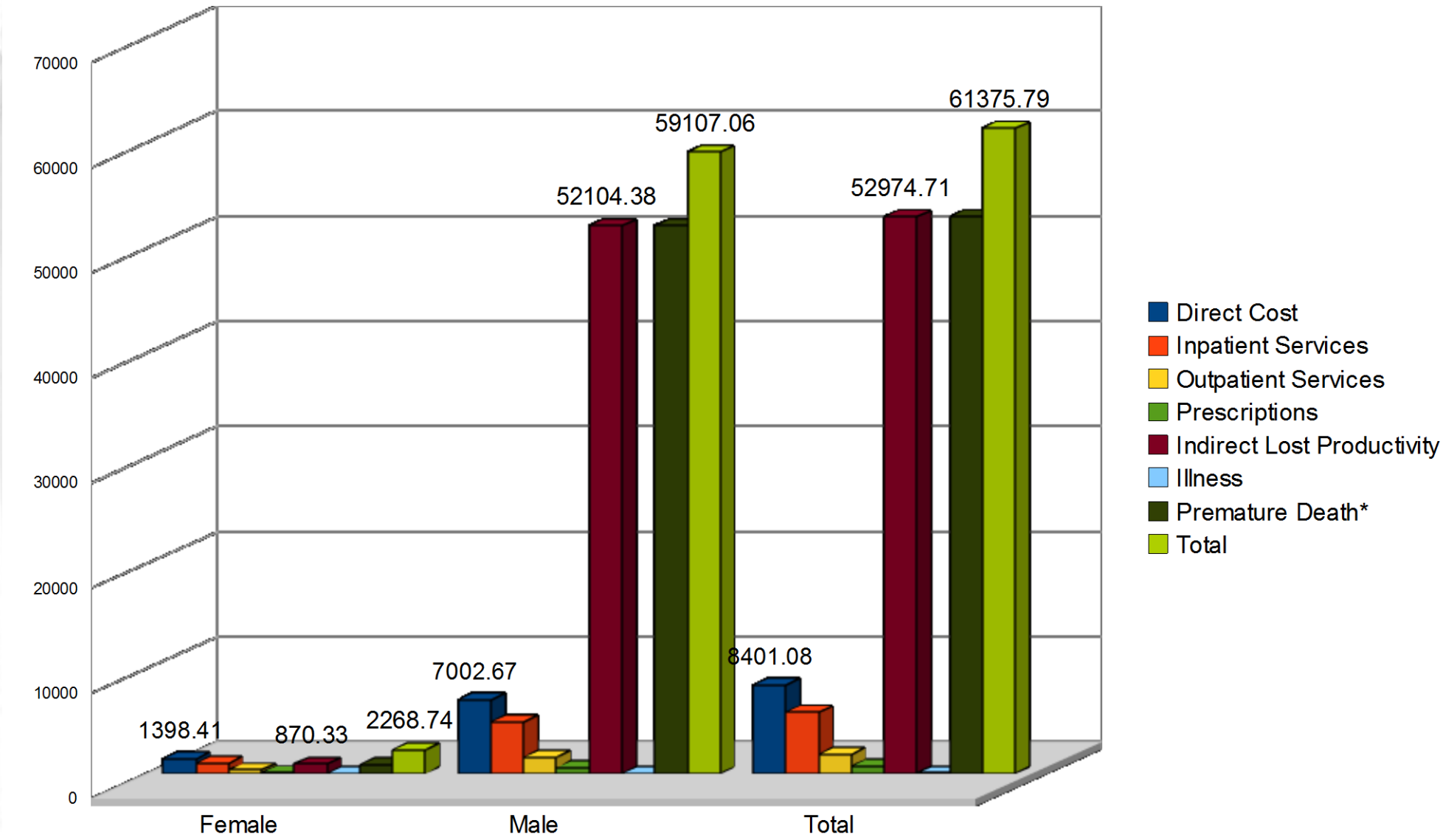


Table 24. Cost of Smoking by Type of Cost and Gender, Indonesia, 2010 (in Billion Rp.)



5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

- It was estimated that the total costs of smoking in Indonesia in 2010 were Rp. 61.4 trillion(USD 7.9 billion) or 2.8 % of GDP. It consists of 13.7% direct costs and 86.3% indirect costs.
- The costs of smoking incurred by males is very much higher than that of females.

5.2 Recommendation

- Further research is needed, preferably using a cohort method and targeting specific groups such as women, adolescent and other groups of interest to policy makers.
- The author intends that this paper could be useful to convince the local government to establish policy towards tobacco control on the basis of national settings.

THANK YOU

Pamulang, March 30th 2015