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The burden of tobacco in Nepal: a systematic analysis from the Global Burden of Disease Study 1990-2017

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e burden of tobacco in Nepal: a systematic analysis from the Global Burden of Line and the systematic analysis from the systematic analysis f BMJ Open

4. Department of Cancer Prevention, Control and Research, B.P. Koirala Memorial Cancer Hospital, Chievan Nepal

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Article Summary

Strengths and limitations of this study

• This study is one of the first studies in Nepal to extracts Global Burden of Disease Study data to present mortality and disability

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- It shows more than one-third increase in mortality and 3% increase in disability adjusted life years attributable to different form of tobacco use.
- It analyses the secondary data of Global Burden of Disease Study and hence has all the limitation give data in the data.

ABSTRACT Background: Tobacco consumption has been a major public health issue worldwide because of its agiocrated high morbidity and mortality. This study attempts to systematically review the data extracted from the global burden disease study and set out to assess the age-sex-specific mortality and disability attributable to different forms of tobacco from 1990 to 2017, for Aleaal.

Methods: The Institute for Health Metrics and Evaluation's Global Burden of Disease database was used for the extraction of data related to age-sex-specific mortality and disability-adjusted life years (DALYs), then was quantitatively and yzed to show the trends and patterns in age-sex-specific deaths and DALYs attributable to tobacco use from different diseases for by the year 1990 to 2017 in a Nepal.

Results: In between 1990 and 2015, the prevalence of tobacco smoking significantly decreased by 15% in male, 11% in female, and 13% in both. By 2017, the total deaths attributable to tobacco use, including any form, increased by 39% in both gender and DALYs attributable to tobacco use, including any form, in all ages increased by 11% males but decreased by 9% in females, with tobacco

BMJ Open smoking having the most contribution. An increasing rate of deaths and DALYs attributable to tobacco age. Non-communicable diseases were responsible for most deaths and disabilities attributable to tobacco

Conclusion: There was a more than one-third increase in mortality and a 3% increase in DALY, though the smoking prevalence is in decreasing trend. There is a huge increase in deaths and DALYs due to chewing tobacco. A strong imp imp intation plan is needed to t 2021. Downloaded from http://b eignement Superieur (ABES) . related to text and data mining, / control all forms of tobacco including second-hand exposure.

Keywords: tobacco; global burden of diseases; Nepal; DALY.

INTRODUCTION

Deer ro, To date, tobacco remains a major public health issue worldwide because of its associated high morbidity and mortality rate. Any forms of tobacco use are harmful to health and kill millions of people every year.¹ Tobacco is commonly used in either smoking or smokeless form, both are highly addictive forms. There is no safety margin for exposure to second-hand smoke or back or smoking and secondhand smoke exposure is equally harmful to health. The use of tobacco products or exposure to second-hand smoke has been implicated to many health issues like cardiovascular diseases, respiratory diseases, cancers, non-communicable diseases (NCD), and many more.^{2,3}

According to the World Health Organization (WHO), about 1.3 billion people in the world used tobacco products among which more than one billion people were smokers.⁴ Almost over 80% of the smokers reside in low- and middle-inco rates of tobacco use differ widely among different geographical regions, and the number of male smokers compared with female smokers is higher in all regions. The last two decades have seen a decreasing trend towards the consumption of tobacco in all age groups. In 2000, almost one-third of the world's population (33.3%) aged 15 and more used some form of tobacco preducts, 50% in males and 16.7% in female. While in 2015, the prevalence of tobacco use dropped to nearly a quarter of the world's population (24.9%), 40.3% in

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BMJ Open males and 9.5% in females.¹ Despite the decreasing prevalence of tobacco use globally, the absolute number of male smokers is growing continuously in South-East Asian, African, and Eastern Mediterranean regions. The South-East Asian region has the highest prevalence of tobacco use (31% in 2015) compared with other regions, 49.4% in males and 12.9% in females.¹ According to recent findings from STEPS survey 2019 in Nepal, around 29% of adults (48% male and 12% female) within the age group $\frac{1}{45}$ years used any form of tobacco, either smoking or smokeless.⁵ In recent times, people have shown a growing preference for smokeless tobacco over smoking in South-East Asia including Nepal.⁶⁻⁸ In Nepal, the use of smokeless tobacco is much more common than the state of smoking and is more prevalent among males (33%) compared with females (5%).⁵ Despite decreasing prevalence, the number of deaths due to tobacco use continues to rise. Tobacco kills are than 8 million people

every year. Among them, about 7 million people die from direct tobacco use while the deaths of about \$\$\vec{B}\$\vec{s}\$\vec{m}\$ illion people result from second-hand smoke exposure.⁴ In 2015, smoking alone was responsible for 11.5% and 6% of global dealing and DALYs respectively.⁹ Deaths of about 65,000 children per year can be attributed to exposure from second-hand smoke.¹⁰ The Lecast estimates show around US\$ 1.4 trillion of total economic loss results globally from tobacco use which is equivalent to 1.8% of the word d's annual GDP.¹¹ About 40% of this cost occurred in developing countries. In Nepal, around 27 thousand deaths occur annually from tobacco use, which and comprises about 14.9% of all deaths.¹²

Given such a significant negative impact of tobacco on public health, navigation of the outcomes of tobaccar in a low-income country like Nepal is of the essence. The issue of tobacco usage has received considerable attention. In response, Bepal implemented the WHO Framework Convention on Tobacco Control (WHO FCTC) in 2006¹³ and passed Tobacco Control and Regulatory Bill in 2011 by the Parliament⁵. So far, however, there has been little discussion about trends and patterns of tobacco use an its outcomes in Nepal. Such approaches have an unsatisfactory description of the burden of tobacco in the Nepalese population. This study tries to systematically evaluate the trends in mortality and DALYs attributable to smoking, tobacco use, chewing tobacco, and second-hand smoking by sex in Nepal from 1990 to 2017. For this, we explored the leading cause of mortality and DALYs attributable to to acco in the same period. Thus, this study attempts to systematically review the data extracted from the global burden disease study 20 and set out to assess the

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BMJ Open age-sex-specific mortality and disability attributable to different forms of tobacco from 1990 to 2017, for herefore, the findings of this study will make a major contribution to research by providing important insights into evidence for anteffective tobacco control on 23 August 2021. Downloaded from ht Enseignement Superieur (ABES ing for uses related to text and data min program in Nepal.

METHODS

Data sources and extraction

ior peer The global burden of disease study 2017 was a comprehensive epidemiological study that reported the trends and patterns in morbidity and mortality in 195 countries from major injuries, diseases, and risk factors to health at the global, regional and national level. The study design, metrics, and analysis are published elsewhere.¹⁴ The Institute for Health Metrics and Evaluation (IHME)'s Global Burden of Disease (GBD) database was used for the extraction of data related to age-sex-specific mortality and disability-adjusted life years (DALYs) of all causes and other major public health issues of Nepal like cardiovascular diseases, diabetes and kidney disease, all neoplasms, NCD, and tuberculosis from the year 1990 to 2017.¹⁵ Patient and public involvement statement This study used the data freely available from The Institute for Health Metrics and Evaluation (IHME)'s Global Burden of Disease

(GBD) database. Patients were not involved in the design, recruitment, or conduct of the study. Results of this study will be made publicly available through publication. Bibliographique de l

Definition of terminology

cted by copyright<u>A</u>ll D Disability-adjusted life year (DALY): According to the World Health Organization (WHO, 2012), ncluding 7847 on potential life lost due to premature mortality and the years of productive life lost due to disability".¹⁶ Age-standardized mortality rate (ASMR): According to the World Health Organization (WHO, 2015), ASMR is "a weighted average of the age-specific mortality rates per 100,000 persons, where the weights are the proportions of persons in give orresponding age groups eignem related t 2021. Downloaded of the WHO standard population".¹⁷ The term tobacco includes tobacco use in all forms including smoking and smokeless form. Statistical analysis and interpretation The extracted data from IHME was imported into Microsoft Excel, then was quantitatively analyzed and be esented in the graphical, tabular forms and histograms to show the trends and patterns in age-sex-specific mortality and DALYs in New 1. Statistical significance erien ://bmjopen.bmj.com of p-value less than 0.05 was considered. Al training, and **RESULTS** Ś Here we report the GBD study results for Nepal on the prevalence of tobacco use, mortality, and burder bed by different forms of

une 1 tobacco, smoking, and smokeless tobacco, between 1990 and 2017. techno

In 1990, the prevalence of tobacco smoking at all ages was 32.5% (27.2%-38%) for both sexes. It was 4 28% (37.2%-46.6%) for male and 23.5% (17.5%-29.8%) for female. In 2015, the prevalence of tobacco smoking decreased to 19.7% (16.4%-23.4%) in both sexes at Agence Bibliographique de l all ages, with male 27.4% (23.9%-31.4%) and female 12.7% (9.6%-16%) [Figure 1].

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 <td (both male and female) from 19372 (95% UI 16060-23310) in 1990 to 26926 (95% UI 22826-31135) in 20 at [Table 1]. While DALYs for all ages due to tobacco use increased (10.52%) in males from 403665 (95% UI 319794-512870) in 199 524648) in 2017, it decreased (8.78%) in females from 280977 (95% UI 205487-373384) in 1990 to 256 30 305% UI 205569-316573) in 2017 [Table 2]. Similarly, the attributable deaths and DALYs at all ages due to tobacco smoking and when the bacco showed increasing trends while that due to second-hand smoking showed falling trends for both sexes. Over the Bar time period, the agestandardized deaths and DALYs to tobacco use, tobacco smoking, chewing tobacco, secondhand smoking standardized falling trend for both ≘s) . ining, http://b sexes.

Table 1. All-Age Deaths in number and Age Standardized Deaths for different diseases in different forms of tobacco and their percentage change in ainir Nepal, 1990-2017 ē

| | All-Age Deaths, No. in Thousands (95% UI) | | | Age-Standardized Deaths, inद्सिatiss per 100,000(95%UI) | | | |
|-------------|---|--------------------------------|--------------|---|---------------------------|-------------|--|
| Subcategory | 1990 | 2017 | change, % | 1990 | nd sim | Change % | |
| All causes | | | | | nilan (| | |
| Tobacco | | | | | lune | | |
| Male | 11763.49 (9612.18-14237.80) | 17372.20 (14056.39-20307.12) | 47.68 | 258.31 (210.40-311.96) | 19261 (±57.59-222.97) | -25.44 | |
| Female | 7608.83 (5827.14-9679.57) | 9553.55 (7463.66-12031.65) | 25.56 | 173.77 (132.36-221.72) | 955 (76.10-122.53) | -43.86 | |
| Both | 19372.32 (16059.91-23310.44) | 26925.75 (22826.17-31135.35) | 38.99 | 216.59 (183.28-258.18) | 14995 (\$20.86-163.38) | -34.46 | |
| Smoking | (, | (| | (, | es 5 | | |
| Male | 9858.89 (8016.19-12138.96) | 15573.83 (12511.70-18320.09) | 57.97 | 233.81 (188.33-287.71) | 173.70 (440.69-202.11) | -25.71 | |
| Female | 5619.71 (4163.78-7373.09) | 7984.05 (6026.50-10280.06) | 42.07 | 145.70 (107.91-191.96) | 82.34 (2.37-105.36) | -43.49 | |
| Both | 15478.60 (12838.83-18675.51) | 23557.88 (19798.77-27400.07) | 52.20 | 190.28 (157.79-229.81) | 124.98 (204.95-145.25) | -34.32 | |
| Chewing | | | | | Ce | | |
| tobacco | 324.53 (221.95-453.10) | 595.13 (412.87-782.12) | 83.38 | 6.27 (4.33-8.66) | 5.88 🚾 4.11-7.71) | -6.16 | |
| Male | 142.83 (98.54-201.01) | 268.19 (194.01-356.27) | 87.76 | 3.50 (2.47-4.87) | 2.61 9 (1.89-3.45) | -25.46 | |
| Female | 467.36 (351.24-609.37) | 863.32 (664.09-1073.70) | 84.72 | 4.94 (3.79-6.31) | 4.18 8 3.24-5.21) | -15.49 | |
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| 1409.64-2638.17) 2 4645.29-7010.77) 9 2688.03-4375.06) 9 1150.06-2269.44) 2 4033.28-6349.49) 8 (335.36-642.16) 2 (279.69-543.01) 9 | 2759.22 (2031.88-3598.37) 9944.13 (7888.43-12157.90) 6398.37 (4808.50-7886.57) 2305.75 (1631.12-3096.08) 8704.12 (6785.50-10755.96) 1019.62 (716.19-1367.19) 552.72 (399.72-738.60) | 42.23 73.50 85.28 41.34 71.18 116.81 40.86 | 44.72 (32.51-60.62) 62.60 (50.60-76.99) 72.05 (56.17-91.65) 37.58 (26.31-52.83) 55.18 (43.64-69.61) 10.33 (7.50-13.98) 8.93 (6.42-12.28) | 26,58,65-33.50) 46,57,76-58,00) xt gans 48,14-78,29) 26,002,17-50,97) 46,42,21,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,45,51,7-50,97) 47,51,7-50,970 | -4 -2 -1 -4 -2 2 -4 |
| 1409.64-2638.17) 2 4645.29-7010.77) 9 2688.03-4375.06) 9 1150.06-2269.44) 2 4033.28-6349.49) 8 (335.36-642.16) 2 (279.69-543.01) 9 | 2759.22 (2031.88-3598.37) 9944.13 (7888.43-12157.90) 6398.37 (4808.50-7886.57) 2305.75 (1631.12-3096.08) 8704.12 (6785.50-10755.96) 1019.62 (716.19-1367.19) 552.72 (399.72-738.60) | 42.23 73.50 85.28 41.34 71.18 116.81 40.86 | 44.72 (32.51-60.62) 62.60 (50.60-76.99) 72.05 (56.17-91.65) 37.58 (26.31-52.83) 55.18 (43.64-69.61) 10.33 (7.50-13.98) 8.93 (6.42-12.28) | 26,58,65-33.50) 46,57,76-58,00) xt gans 48,14-78,29) 26,002,17-50,97) 46,42,21,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,45,51,7-50,97) 47,51,7-50,970 | -2 -2 -1 -2 -2 -2 -2 -2 -2 |
| 1409.64-2638.17) 2 4645.29-7010.77) 9 2688.03-4375.06) 9 1150.06-2269.44) 2 4033.28-6349.49) 8 (335.36-642.16) 2 (279.69-543.01) 9 | 2759.22 (2031.88-3598.37) 9944.13 (7888.43-12157.90) 6398.37 (4808.50-7886.57) 2305.75 (1631.12-3096.08) 8704.12 (6785.50-10755.96) 1019.62 (716.19-1367.19) 552.72 (399.72-738.60) | 42.23 73.50 85.28 41.34 71.18 116.81 40.86 | 44.72 (32.51-60.62) 62.60 (50.60-76.99) 72.05 (56.17-91.65) 37.58 (26.31-52.83) 55.18 (43.64-69.61) 10.33 (7.50-13.98) 8.93 (6.42-12.28) | 26,58,65-33.50) 46,57,76-58,00) xt gans 48,14-78,29) 26,002,17-50,97) 46,42,21,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,45,51,7-50,97) 47,51,7-50,970 | -4 |
| 1409.64-2638.17) 2 4645.29-7010.77) 9 2688.03-4375.06) 9 1150.06-2269.44) 2 4033.28-6349.49) 8 (335.36-642.16) 2 (279.69-543.01) 9 | 2759.22 (2031.88-3598.37) 9944.13 (7888.43-12157.90) 6398.37 (4808.50-7886.57) 2305.75 (1631.12-3096.08) 8704.12 (6785.50-10755.96) 1019.62 (716.19-1367.19) 552.72 (399.72-738.60) | 42.23 73.50 85.28 41.34 71.18 116.81 40.86 | 44.72 (32.51-60.62) 62.60 (50.60-76.99) 72.05 (56.17-91.65) 37.58 (26.31-52.83) 55.18 (43.64-69.61) 10.33 (7.50-13.98) 8.93 (6.42-12.28) | 26,58,65-33.50) 46,57,76-58,00) xt gans 48,14-78,29) 26,002,17-50,97) 46,42,21,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,42,51,7-50,97) 46,45,51,7-50,97) 47,51,7-50,970 | -4 |
| 4645.29-7010.77) 9 2688.03-4375.06) 1 1150.06-2269.44) 2 4033.28-6349.49) 8 (335.36-642.16) (279.69-543.01) | 9944.13 (7888.43-12157.90) 6398.37 (4808.50-7886.57) 2305.75 (1631.12-3096.08) 8704.12 (6785.50-10755.96) 1019.62 (716.19-1367.19) 552.72 (399.72-738.60) | 73.50 85.28 41.34 71.18 116.81 40.86 | 62.60 (50.60-76.99) 72.05 (56.17-91.65) 37.58 (26.31-52.83) 55.18 (43.64-69.61) 10.33 (7.50-13.98) 8.93 (6.42-12.28) | Change 14.14-78.29) 24.14.14-78.29) 24.14.14.77.71.13.79) 24.15.14.77.71.9.91) | -2 |
| 2688.03-4375.06) 1150.06-2269.44) 4033.28-6349.49) (335.36-642.16) (279.69-543.01) | 6398.37 (4808.50-7886.57) 2305.75 (1631.12-3096.08) 8704.12 (6785.50-10755.96) 1019.62 (716.19-1367.19) 552.72 (399.72-738.60) | 85.28 41.34 71.18 116.81 40.86 | 72.05 (56.17-91.65) 37.58 (26.31-52.83) 55.18 (43.64-69.61) 10.33 (7.50-13.98) 8.93 (6.42-12.28) | Change 14.14-78.29) 24.14.14-78.29) 24.14.14.77.71.13.79) 24.15.14.77.71.9.91) | -1 -2 -2 -2 |
| 1150.06-2269.44) 24033.28-6349.49) 8 (335.36-642.16) (279.69-543.01) | 2305.75 (1631.12-3096.08) 8704.12 (6785.50-10755.96) 1019.62 (716.19-1367.19) 552.72 (399.72-738.60) | 41.34 71.18 116.81 40.86 | 37.58 (26.31-52.83) 55.18 (43.64-69.61) 10.33 (7.50-13.98) 8.93 (6.42-12.28) | ä A S m B B B C C C C C C C C | -4 -2 2 -4 |
| 1150.06-2269.44) 24033.28-6349.49) 8 (335.36-642.16) (279.69-543.01) | 2305.75 (1631.12-3096.08) 8704.12 (6785.50-10755.96) 1019.62 (716.19-1367.19) 552.72 (399.72-738.60) | 41.34 71.18 116.81 40.86 | 55.18 (43.64-69.61) 10.33 (7.50-13.98) 8.93 (6.42-12.28) | ä A S m B B B C C C C C C C C | -4 -2 2 -4 |
| (335.36-642.16) (279.69-543.01) | 1019.62 (716.19-1367.19) 552.72 (399.72-738.60) | 116.81 40.86 | 10.33 (7.50-13.98) 8.93 (6.42-12.28) | ä A S m B B B C C C C C C C C | |
| (279.69-543.01) | 552.72 (399.72-738.60) | 40.86 | 8.93 (6.42-12.28) | ä A S m B B B C C C C C C C C | -4 |
| (279.69-543.01) | 552.72 (399.72-738.60) | 40.86 | 8.93 (6.42-12.28) | ₩ .15, 3.72-6.88) 2.68 5.71-9.91) | _4 |
| (279.69-543.01) | 552.72 (399.72-738.60) | 40.86 | 8.93 (6.42-12.28) | ₫.1533.72-6.88) ≥.6895.71-9.91) | -4 |
| · · · · · · · · · · · · · · · · · · · | | | · · · · · · · · · · · · · · · · · · · | ∠ .68 9 5.71-9.91) | |
| 045.57-1150.15) | 1572.55 (1155.02-2052.89) | 02.27 | 9.05 (7.50-12.52) | | |
| | | | | <u></u> | |
| ases | | | | traini | |
| | | | | n.br | |
| (46.50-132.87) | 341.19 (212.30-499.97) | 279.71 | 2.40 (1.24-3.52) | a.0472.52-5.88) | (|
| (40.03-146.03) | 320.67 (180.70-493.02) | 284.24 | 2.25 (1.08-3.91) | 3 .36 1 .88-5.12) | 2 |
| (104.61-250.63) | 661.86 (423.10-933.46) | 281.89 | 2.32 (1.40-3.39) | 5 .68 (2.34-5.22) | 5 |
| | | | | ila | |
| (31.00-92.21) | 215.64 (125.04-325.16) | 259.10 | 1.52 (0.79-2.35) | 2.49 (1.44-3.68) | 6 |
| (16.74-70.51) | 135.17 (71.15-222.16) | 251.37 | 0.99 (0.44-1.80) | | 3 |
| (56.73-144.71) | 350.81 (205.70-514.87) | 256.08 | 1.26 (0.73-1.84) | 90-1.09-2.82) 90-2.009-2.82) 90-2.009-2.82) 90-2.009-2.82) 90-2.009-2.82) 90-2.009-2.82) 90-2.009-2.82) 90-2. | 5 |
| | | | | 20 log | |
| (12.48-60.40) | 143.98 (52.67-241.44) | 306.69 | 1.02 (0.37-1.76) | 9 78 9 65-2.96) | 7 |
| (16.07-97.51) | 199.24 (74.84-338.96) | 301.03 | 1.38 (0.47-2.58) | 2.12 (0.79-3.57) | 4 |
| (30.02-145.39) | 343.22 (128.33-559.19) | 303.39 | 1.20 (0.44-2.01) | 1.96 0.74-3.16) | e |
| | | | | en Ce | |
| | | | | | |
| | | | | | |
| , | | 91.69 | 30.95 (24.06-39.91) | | - |
| | 1355.16 (979.14-1773.62) | 59.28 | 19.39 (13.78-25.56) | 7 | - |
| 606.63-1144.57) | | | | hiqu | |
| 606.63-1144.57) | | | | Ie c | |
| | | | | <u>u</u> | |
| | , | | | | 1139.03-1890.08) 2795.38 (2190.73-3628.29) 91.69 30.95 (24.06-39.91) 28.96 (22.83-37.32) |

| | | BN | /J Open | | cted by copyrigh(5114,50-24.68) | Pa |
|-----------------|------------------------------|---|---------|------------------------|--|------------------|
| | | | | | n-202(vpyrigl | |
| Both Smoking | 2309.11 (1829.24-2855.31) | 4150.54 (3336.01-5024.85) | 79.75 | 25.33 (20.13-31.34) | ād | -19.00 |
| Male | 1250.10 (975.25-1649.62) | 2401.44 (1848.26-3151.69) | 92.10 | 27.08 (21.06-35.75) | 25.14 9.63-32.65) | -7.15 |
| Female | 720.15 (488.16-1000.56) | 1097.67 (750.55-1488.11) | 52.42 | 16.42 (11.15-22.30) | B .55 0 7.22-14.28) | -35.75 |
| Both | 1970.25 (1545.76-2475.89) | 3499.11 (2734.84-4290.12) | 77.60 | 21.87 (17.21-27.66) | 19 .43 1 3.68-21.32) | -20.30 |
| Chewing | 224 52 (221 05 452 10) | 505 12 (112 07 702 12) | 02.20 | | | (1) |
| tobacco | 324.53 (221.95-453.10) | 595.13 (412.87-782.12) | 83.38 | 6.27 (4.33-8.66) | 5 .88 2 4.11-7.71) | -6.16 |
| Male Female | 142.83 (98.54-201.01) | 268.19 (194.01-356.27) | 87.76 | 3.50 (2.47-4.87) | 82.5 17 (1.89-3.45) (4.88 (3.24-5.21) | -25.46 -15.49 |
| Both | 467.36 (351.24-609.37) | 863.32 (664.09-1073.70) | 84.72 | 4.94 (3.79-6.31) | e ci N | -13.49 |
| Secondhand | | | | | 021 Jner late | |
| smoking | | | | | id me f. | |
| Male | 21.07 (8.88-41.47) | 41.08 (18.62-77.70) | 95.01 | 0.45 (0.19-0.91) | 9 . ‡ 2 9 0.19-0.78) | -7.22 |
| Female | 34.30 (13.82-61.95) | 71.29 (29.95-123.53) | 107.84 | 0.71 (0.28-1.28) | 2 <u>2</u> <u>3</u> 0.26-1.08) | -12.63 |
| Both | 55.37 (28.26-90.91) | 112.37 (57.13-183.26) | 102.96 | 0.58 (0.30-0.97) | a) | -9.13 |
| Non commu | nicable diseases | | | | nd ded f | |
| Non-commu | | | | | ta pro | |
| Tobacco | | C.F. | | | 3 2 3 | |
| Male | 9084.74 (7213.20-11113.09) | 15843.57 (12712.23-18568.33) | 74.40 | 218.16 (173.73-265.37) | 17 280 42.88-204.64) | -19.38 |
| Female | 5405.68 (4000.45-7169.95) | 8479.47 (6562.76-10786.52) | 56.86 | 142.34 (104.66-187.72) | 8699 (6.91-110.32) | -38.88 |
| Both | 14490.42 (12108.44-17315.76) | 24323.04 (20523.48-28032.74) | 67.86 | 180.75 (151.51-216.69) | 12854 (108.71-148.12) | -28.88 |
| Smoking Male | 8360.61 (6594.62-10279.50) | 14278.19 (11397.99-16901.41) | 70.78 | 201.54 (159.38-247.44) | 15 28.76-185.87) | -21.10 |
| Female | 4650.42 (3337.03-6281.82) | 7178.97 (5429.79-9244.20) | 54.37 | 123.38 (88.81-165.96) | 7 4 :07 5 5.75-95.36) | -39.97 |
| Both | 13011.04 (10706.22-15734.95) | 21457.17 (17836.70-25205.32) | 64.92 | 162.93 (134.84-196.44) | 1 1 2 4 2 4.11-132.80) | -30.19 |
| Chewing | | , | | , | | |
| tobacco | 324.53 (221.95-453.10) | 595.13 (412.87-782.12) | 83.38 | 6.27 (4.33-8.66) | a .88 <mark>2</mark> 4.11-7.71) | -6.16 |
| Male | 142.83 (98.54-201.01) | 268.19 (194.01-356.27) | 87.76 | 3.50 (2.47-4.87) | ≌ .61 ₹ 1.89-3.45) | -25.46 |
| Female | 467.36 (351.24-609.37) | 863.32 (664.09-1073.70) | 84.72 | 4.94 (3.79-6.31) | ₹.18 9 3.24-5.21) | -15.49 |
| Both | | | | | ar t | |
| Secondhand | | | | | une | |
| smoking Male | 826.51 (544.18-1157.79) | 1707.58 (1204.09-2298.64) | 106.60 | 20.73 (13.44-29.41) | 10,10,13,45-25.79) | -7.84 |
| Female | 885.80 (562.91-1315.63) | 1428.84 (955.94-2015.36) | 61.31 | 23.01 (14.20-34.45) | $\overline{\mathbf{D}}_{4}$ 46 N 9 48-20 35) | -37.17 |
| Both | 1712.31 (1160.43-2406.58) | 3136.42 (2218.91-4183.96) | 83.17 | 21.88 (14.28-30.81) | D .4609.48-20.35) 16:64 D 1.75-22.37) | -23.92 |
| | | | | . , | s ar | |
| Tuberculosis | | | | | A ge | |
| Tobacco | | | | | nc | |
| Male | 1065.82 (611.69-1723.30) | 533.34 (298.43-827.30) | -49.96 | 20.61 (11.78-33.64) | 5.29 6 2.98-8.12) | -74.34 |
| Female | 667.34 (210.36-1288.01) | 267.93 (114.47-461.56) | -59.85 | 13.55 (4.08-27.10) | 2.43 (1.04-4.25) | -82.06 |
| Both | 1733.16 (962.41-2696.31) | 801.27 (445.52-1198.40) | -53.77 | 17.14 (9.42-27.10) | 3.78 3 2.13-5.69) | -77.94 |
| Smoking | | | | | gra | |
| | | | | | aphique | |
| | | | | | que | 9 |
| | - | peer review only - http://bmjope | | | 0 | |

| | | В | MJ Open | | | 36/bmjopen-202 cted by copyrig |
|------------------------|---|---|---------------------------------------|----------------|---|--|
| Male | 1065.82 (611.69-1723.30) | 533.34 (298.43-827.30) | -49.96 | | 61 (11.78-33.64) | 5.29 9 2.98-8.12) |
| Female Both | 667.34 (210.36-1288.01) 1733.16 (962.41-2696.31) | 267.93 (114.47-461.56) 801.27 (445.52-1198.40) | -59.85 -53.77 | | 55 (4.08-27.10) 14 (9.42-27.10) | ii ; 43 7 1.04-4.25) ii ; 43 7 2.13-5.69) ii ; o |
| Table 2. All-4 2017 | Age DALYs and Age Standardize | d DALYs for different disc | eases in diff | ferent fo | rms of tobacco and their | for 23 |
| | All-Age DALYs | , No. in Thousands (95% U | Л) | | Age Standardized DA | Lusian Rate per 100,00 |
| Subcatego ry | 1990 | 2017 | cl | hange, % | 1990 | to t |
| All causes | | | | | | ext ext |
| | | | | | | and and |
| Tobacco | | | | | | |
| Male | 403665.07 (319794.17-512869.65) | 446131.58 (364621.77-5246 | · · · · · | 10.52 | 6479.90 (5370.92-7761.64) | |
| Female | 280977.20 (205487.39-373383.63) | 256300.53 (205568.71-3165 | | -8.78 | 4417.82 (3434.48-5521.70) | a 2259.71 (1807.00-2790. |
| Both | 684642.27 (538331.13-875950.09) | 702432.11 (593052.53-8124 | 25.42) | 2.60 | 5474.76 (4575.91-6509.77) | |
| Smoking | | | | | | nin S) <mark>ff</mark> |
| Male | 280385.51 (227328.27-345198.66) | 387323.13 (314734.78-4582 | | 38.14 | 5460.34 (4494.44-6658.41) | - |
| Female | 153618.50 (116802.49-200154.70) | 201074.00 (155098.74-2532 | | 30.89 | 3280.63 (2506.14-4233.47) | |
| Both | 434004.01 (360694.99-523145.50) | 588397.13 (487193.19-6906 | 55.02) | 35.57 | 4397.13 (3669.32-5255.62) | ₹273 <mark>8</mark> :68 (2284.27-3196 |
| Chewing | | | | | | ain pe |
| tobacco | 9802.97 (6587.60-13907.45) | 15546.94 (10681.34-20552 | | 58.59 | 168.65 (114.63-236.68) | n i 1 <mark>4</mark> 1.37 (97.27-186.2 |
| Male | 3558.17 (2385.54-5110.57) | 6011.17 (4233.98-8176.4 | | 68.94 | 73.41 (50.23-103.75) | 9 2 .22 (37.00-70.13) |
| Female | 13361.13 (9934.89-17759.87) | 21558.11 (16005.69-27194 | 4.58) | 61.35 | 122.55 (91.82-159.88) | and \$4.91 (71.42-119.17 |
| Both | | | | | | |
| Secondhand | | | | | | sin 2 |
| smoking | | | | | | ila on |
| Male | 125282.54 (64552.81-208075.08) | 61759.15 (44109.97-84284 | | -50.70 | 1086.43 (673.97-1635.96) | 549.55 (390.79-739.7 |
| Female | 130921.51 (68925.95-212905.05) | 58748.28 (40421.33-80159 | · · · · · · · · · · · · · · · · · · · | -55.13 | 1224.70 (741.83-1844.80) | similar 549.55 (390.79-739.7 549.55 (390.79-739.7 tec h 519.66 (368.38-681.6 |
| Both | 256204.06 (133797.03-415607.64) | 120507.43 (86416.83-16264 | 40.49) - | -52.96 | 1154.42 (715.21-1723.62) | <u>o</u> <u>2</u> , |
| Cardiovasc | ılar diseases | | | | | 202! |
| Tobacco | | | | | | es. |
| Male | 106045.53 (82267.08-133672.18) | 178781.72 (135047.16-2208 | (60.34) | 68.59 | 1936.27 (1511.95-2423.60) | |
| Female | 51596.75 (37925.85-69499.33) | 68559.09 (51346.16-88568 | | 32.87 | 1936.27 (1511.95-2423.60) 1031.71 (759.76-1395.12) | 5 \$.31 (436.90-754.2 |
| Both | 157642.28 (126776.05-193554.33) | 247340.82 (194740.00-3031 | | 52.87 56.90 | 1496.61 (1211.38-1833.80) | |
| Smoking | 157072.20(120770.05-175554.55) | 27/370.02 (174/40.00-3031 | 50.50 | 50.70 | 1770.01 (1211.30-1033.80) | TUDI (004.04-1333) |
| Male | 96619.66 (74256.90-122738.75) | 159276.84 (119281.99-1989 | 37.41) | 64.85 | 1764.47 (1368.64-2229.23) | 1469.62 (1100.22-1816 |
| Female | 42772.31 (30386.44-59660.41) | 56949.09 (41194.34-7568) | | 33.14 | 866.98 (622.05-1191.46) | 4.27.20 (350.81-645.5 |
| Both | 139391.98 (110502.77-173724.72) | 216225.93 (167097.28-2672 | | 55.14 55.12 | 1328.36 (1051.46-1644.91) | |
| Dom | 155571.70 (110502.77-175727.72) | 210223.75 (107077.2022072 | | 00.14 | 1520.50 (1051.40-1044.91) | bi ique |
| | | | | | | <u>.</u> |
| | | | | | | que |

| | | BMJ Ope | 'n | | 6/bmjc | Pa | age 1 |
|--|---|--|---|---|--|--|-------|
| | | | | | cted by copyright, including fo 1723.07 (164.09-318.59) 1723.07 (164.09-318.59) 1723.07 (100-318.59) 1723.07 (100- | | |
| Secondhand | | | | | 0-0 ht, | | |
| smoking | | | | | in 47: | | |
| Male | 13262.84 (9357.97-18103.45) | 25748.76 (17829.80-34584.44) | 94.14 | 239.06 (170.65-325.81) | د 2 3 .07 (164.09-318.59) | -0.83 | |
| Female | 11177.24 (7815.41-15454.67) | 14258.69 (10012.59-19091.91) | 27.57 | 209.45 (149.20-289.64) | d 10/7.97 (83.21-157.40) | -43.68 | |
| Both | 24440.09 (18131.54-32553.33) | 40007.45 (28671.94-52101.01) | 63.70 | 224.55 (167.63-294.69) | 1 74.52 (127.17-225.73) | -22.28 | |
| Diabetes | | | | | | | |
| Tobacco | | | | | Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars Stars | | |
| Male | 6537.41 (4043.63-9355.31) | 16371.62 (10553.78-22939.55) | 150.43 | 122.02 (76.26-170.75) | 3 9 5 45 (100.86-216.42) | 27.40 | |
| Female | 5137.20 (2824.43-7939.95) | 13300.29 (7444.24-19447.89) | 158.90 | 100.14 (56.08-152.06) | a 3164.21 (65.15-166.66) | 14.05 | |
| Both | 11674.62 (7240.42-16558.61) | 29671.92 (18547.14-41567.02) | 154.16 | 111.38 (69.92-157.69) | at 133,45 (100.00-210.42) at 134,21 (65.15-166.66) at 133,85 (84.28-188.70) | 20.17 | |
| Smoking | | | | | <u> </u> | | |
| Male | 4392.28 (2637.49-6322.29) | 10215.58 (6340.69-14596.02) | 132.58 | 81.42 (48.91-117.42) | $rac{1}{2}$ $rac{$ | 18.78 | |
| Female | 2188.41 (1197.36-3496.51) | 5142.53 (2903.20-7975.01) | 134.99 | 44.00 (23.92-69.99) | S L 1 5.15 (25.44-69.43) | 2.61 | |
| Both | 6580.70 (4055.51-9682.42) | 15358.11 (9426.86-22203.75) | 133.38 | 63.12 (39.32-92.22) | aperiod.58 (42.63-100.74) | 10.23 | |
| Secondhand | | | | | nd e | | |
| smoking | 0505 01 (055 10 4170 10) | | 150.00 | | | 10.01 | |
| Male | 2525.21 (955.13-4178.18) | 7028.35 (2625.10-11459.51) | 178.33 | 47.87 (18.20-78.84) | | 40.04 | |
| Female | 3218.62 (1162.47-5459.71) | 8689.48 (3316.27-13987.41) | 169.98 | 61.56 (22.44-103.23) | BB73 .72 (28.41-119.04) | 19.75 | |
| Both | 5743.83 (2138.89-9608.90) | 15717.82 (5916.86-24952.45) | 173.65 | 54.62 (20.91-90.45) | m. B 23.72 (28.41-119.04) n. 32 1.65 (26.68-113.48) g | 29.34 | |
| All Neoplasms | | | | | | | |
| Tobacco | | | | | trainin 599.10 (461.65-774.18) | | |
| Male | 38763.61 (30206.76-49414.72) | 63597.51 (48418.72-82150.39) | 64.06 | 719.64 (561.48-925.16) | h 5 ^{30} .10 (461.65-774.18) | -16.75 | |
| Female | 22919.15 (16055.39-31167.33) | 30615.38 (22087.11-40608.53) | 33.58 | 449.04 (319.58-604.71) | 9 2 4 .74 (191.97-350.53) | -41.04 | |
| Both | 61682.77 (48392.88-76293.78) | 94212.89 (74227.14-114859.20) | 52.74 | 588.97 (467.75-728.93) | and 424.87 (338.03-516.50) | -27.86 | |
| | | | | | ld <mark>S</mark> | | |
| Smoking | | | | | | | |
| | 32126.79 (24809.85-42129.01) | 52760.17 (39959.53-69669.29) | 64.22 | 608.89 (473.84-798.63) | S 5 2 .77 (383.81-659.25) | -17.59 | |
| Smoking | 32126.79 (24809.85-42129.01) 19297.97 (12618.21-27388.48) | 52760.17 (39959.53-69669.29) 24084.51 (16609.46-32930.07) | 64.22 24.80 | 608.89 (473.84-798.63) 379.46 (255.47-531.95) | S 5 Q .77 (383.81-659.25) 2 Q .28 (145.63-284.73) | -17.59 -44.59 | |
| Smoking Male | | · · · · · · · · · · · · · · · · · · · | | | E 2 B).28 (145.63-284.73) a 3 4 9.81 (272.49-429.49) | | |
| Smoking Male Female | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) | 24.80 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) | | -44.59 | |
| Smoking Male Female Both | 19297.97 (12618.21-27388.48) | 24084.51 (16609.46-32930.07) | 24.80 49.43 58.59 | 379.46 (255.47-531.95) | | -44.59 -29.78 -16.18 | |
| Smoking Male Female Both Chewing tobacco Male | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) | 24.80 49.43 58.59 68.94 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) | | -44.59 -29.78 -16.18 -28.87 | |
| Smoking Male Female Both Chewing tobacco | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) | 24.80 49.43 58.59 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) | | -44.59 -29.78 -16.18 | |
| Smoking Male Female Both Chewing tobacco Male Female Both | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) 6011.17 (4233.98-8176.42) | 24.80 49.43 58.59 68.94 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) 73.41 (50.23-103.75) | | -44.59 -29.78 -16.18 -28.87 | |
| Smoking Male Female Both Chewing tobacco Male Female Both Secondhand | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) 6011.17 (4233.98-8176.42) | 24.80 49.43 58.59 68.94 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) 73.41 (50.23-103.75) | technologie 12(1.37 (97.27-186.23) 12(1.37 (97.27-186.23)) 12(1.37 (97.27-186.23) 12(1.37 (97.27-186.23)) 12(1.37 (97.27-186.23)) 12(1 | -44.59 -29.78 -16.18 -28.87 | |
| Smoking Male Female Both Chewing tobacco Male Female Both Secondhand smoking | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) 13361.13 (9934.89-17759.87) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) 6011.17 (4233.98-8176.42) 21558.11 (16005.69-27194.58) | 24.80 49.43 58.59 68.94 61.35 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) 73.41 (50.23-103.75) 122.55 (91.82-159.88) | technologies. 19(1.37 (97.27-186.23) 19(2.22 (37.00-70.13) 19(2.22 (37.00-70.13)) 19(2.22 (37.00-70.13) 19(2.22 (37.00-70.13)) 19(2.22 (37.00-70.13)) 19(2 | -44.59 -29.78 -16.18 -28.87 -22.55 | |
| Smoking Male Female Both Chewing tobacco Male Female Both Secondhand smoking Male | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) 13361.13 (9934.89-17759.87) 551.75 (228.76-1067.50) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) 6011.17 (4233.98-8176.42) 21558.11 (16005.69-27194.58) 939.60 (427.81-1780.49) | 24.80 49.43 58.59 68.94 61.35 70.29 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) 73.41 (50.23-103.75) 122.55 (91.82-159.88) 10.32 (4.34-20.07) | technologies. 12(1.37 (97.27-186.23) 12(1.37 (97.27-186.23) 12(2.22 (37.00-70.13) 12(1.42-119.17) 12(1. | -44.59 -29.78 -16.18 -28.87 -22.55 -14.62 | |
| Smoking Male Female Both Chewing tobacco Male Female Both Secondhand smoking Male Female | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) 13361.13 (9934.89-17759.87) 551.75 (228.76-1067.50) 1071.97 (442.54-1953.02) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) 6011.17 (4233.98-8176.42) 21558.11 (16005.69-27194.58) 939.60 (427.81-1780.49) 2081.06 (870.79-3602.03) | 24.80 49.43 58.59 68.94 61.35 70.29 94.13 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) 73.41 (50.23-103.75) 122.55 (91.82-159.88) 10.32 (4.34-20.07) 19.02 (7.78-34.41) | technologies. 12(1.37 (97.27-186.23) 12(1.37 (97.27-186.23) 12(2.22 (37.00-70.13) 12(1.42-119.17) 12(1. | -44.59 -29.78 -16.18 -28.87 -22.55 -14.62 -12.76 | |
| Smoking Male Female Both Chewing tobacco Male Female Both Secondhand smoking Male | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) 13361.13 (9934.89-17759.87) 551.75 (228.76-1067.50) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) 6011.17 (4233.98-8176.42) 21558.11 (16005.69-27194.58) 939.60 (427.81-1780.49) | 24.80 49.43 58.59 68.94 61.35 70.29 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) 73.41 (50.23-103.75) 122.55 (91.82-159.88) 10.32 (4.34-20.07) | technologies. 12(1.37 (97.27-186.23) 12(1.37 (97.27-186.23) 12(2.22 (37.00-70.13) 12(1.42-119.17) 12(1. | -44.59 -29.78 -16.18 -28.87 -22.55 -14.62 | |
| Smoking Male Female Both Chewing tobacco Male Female Both Secondhand smoking Male Female Both | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) 13361.13 (9934.89-17759.87) 551.75 (228.76-1067.50) 1071.97 (442.54-1953.02) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) 6011.17 (4233.98-8176.42) 21558.11 (16005.69-27194.58) 939.60 (427.81-1780.49) 2081.06 (870.79-3602.03) | 24.80 49.43 58.59 68.94 61.35 70.29 94.13 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) 73.41 (50.23-103.75) 122.55 (91.82-159.88) 10.32 (4.34-20.07) 19.02 (7.78-34.41) | technologies. 141.37 (97.27-186.23) 141.37 | -44.59 -29.78 -16.18 -28.87 -22.55 -14.62 -12.76 | |
| Smoking Male Female Both Chewing tobacco Male Female Both Secondhand smoking Male Female Both | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) 13361.13 (9934.89-17759.87) 551.75 (228.76-1067.50) 1071.97 (442.54-1953.02) 1623.73 (810.67-2684.85) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) 6011.17 (4233.98-8176.42) 21558.11 (16005.69-27194.58) 939.60 (427.81-1780.49) 2081.06 (870.79-3602.03) | 24.80 49.43 58.59 68.94 61.35 70.29 94.13 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) 73.41 (50.23-103.75) 122.55 (91.82-159.88) 10.32 (4.34-20.07) 19.02 (7.78-34.41) | technologies. 141.37 (97.27-186.23) 141.37 | -44.59 -29.78 -16.18 -28.87 -22.55 -14.62 -12.76 | |
| Smoking Male Female Both Chewing tobacco Male Female Both Secondhand smoking Male Female Both | 19297.97 (12618.21-27388.48) 51424.76 (40202.22-65087.14) 9802.97 (6587.60-13907.45) 3558.17 (2385.54-5110.57) 13361.13 (9934.89-17759.87) 551.75 (228.76-1067.50) 1071.97 (442.54-1953.02) 1623.73 (810.67-2684.85) | 24084.51 (16609.46-32930.07) 76844.68 (59707.14-94791.62) 15546.94 (10681.34-20552.20) 6011.17 (4233.98-8176.42) 21558.11 (16005.69-27194.58) 939.60 (427.81-1780.49) 2081.06 (870.79-3602.03) | 24.80 49.43 58.59 68.94 61.35 70.29 94.13 | 379.46 (255.47-531.95) 498.15 (390.94-629.30) 168.65 (114.63-236.68) 73.41 (50.23-103.75) 122.55 (91.82-159.88) 10.32 (4.34-20.07) 19.02 (7.78-34.41) | technologies. 12(1.37 (97.27-186.23) 12(1.37 (97.27-186.23) 12(2.22 (37.00-70.13) 12(1.42-119.17) 12(1. | -44.59 -29.78 -16.18 -28.87 -22.55 -14.62 -12.76 | |

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| Tobacco | | | | | nt, 0-0 | |
| Male | 258037.36 (208400.97-311823.54) | 399996.94 (325615.15-473155.30) | 55.02 | 5073.68 (4093.17-6082.55) | 8 386 2 03 (3172.91-4519.86) | -23.76 |
| Female | 149766.37 (113912.16-195422.04) | 222238.88 (176225.32-276201.22) | 48.39 | 3221.12 (2456.18-4144.06) | E 198 5 52 (1586.27-2466.11) | -38.39 |
| Both | 407803.74 (341565.27-482686.51) | 622235.82 (521551.91-724024.44) | 52.58 | 4171.13 (3497.48-4911.28) | 2 88 6 .23 (2423.63-3338.29) | -30.95 |
| Smoking | | | | | ig f | |
| Male | 235498.35 (188051.06-288093.77) | 356411.43 (288822.06-421623.66) | 51.34 | 4660.11 (3736.64-5631.05) | | -25.74 |
| Female | 125863.59 (93741.89-167530.95) | 183252.98 (141279.02-232004.89) | 45.60 | 2750.38 (2049.71-3589.87) | c 165 4 .40 (1277.75-2100.42) | -39.85 |
| Both | 361361.93 (297489.31-433996.59) | 539664.42 (445211.65-635293.86) | 49.34 | 3729.23 (3088.40-4466.96) | 825 85 (2093.96-2941.53) | -32.62 |
| Chewing | 0000 07 ((507 (0 12007 45) | 1554(04 (10(01 24 20552 20) | 59.50 | 1(9)(5)(114)(2)(22)((9) | | 16.10 |
| tobacco Male | 9802.97 (6587.60-13907.45) | 15546.94 (10681.34-20552.20) | 58.59 68.94 | 168.65 (114.63-236.68) | e grige 12 1.37 (97.27-186.23) e grige 2 2.22 (37.00-70.13) | -16.18 -28.87 |
| Female | 3558.17 (2385.54-5110.57) 13361.13 (9934.89-17759.87) | 6011.17 (4233.98-8176.42) 21558 11 (16005 60 27104 58) | | 73.41 (50.23-103.75) | | |
| Both | 13301.13 (9934.89-17759.87) | 21558.11 (16005.69-27194.58) | 61.35 | 122.55 (91.82-159.88) | t a d.91 (71.42-119.17) | -22.5 |
| Secondhand | | | | | teswi | |
| smoking | | | | | text a | |
| Male | 24185.68 (16369.38-33055.50) | 46057.83 (32953.64-60548.19) | 90.43 | 472.79 (313.93-651.81) | and 499.77 (311.91-580.57) | -6.99 |
| Female | 27170.66 (17935.98-39583.53) | 42147.61 (28847.28-57043.88) | 55.12 | 551.53 (358.70-804.61) | a S 4.85 (243.59-491.64) | -34.3 |
| Both | 51356.35 (35980.77-71788.94) | 88205.44 (62908.63-115112.33) | 71.75 | 511.51 (349.86-717.58) | a b b c c c c c c c c c c | -21.9 |
| Dotti | 51550.55 (55700.77 71700.51) | 00203.11(02)00.03 113112.33) | /1./5 | 511.51 (519.00 /11.50) | - m | 21.9 |
| Tuberculosi | 8 | | | | http://www.inir | |
| Tahaaaa | | | | | ng, | |
| Tobacco Male | 34317.44 (19894.39-54836.53) | 15474.57 (8686.80-23623.93) | -54.91 | 581.11 (338.60-930.65) | ≥ 1 1 1 1 1 1 1 1 1 1 | -75.7 |
| Female | 21064.12 (7035.82-39071.66) | 7511.65 (3425.62-12761.83) | -64.34 | 374.51 (122.68-703.54) | 1.02(28.35-105.50) | -83.4 |
| Both | 55381.56 (31368.85-84009.28) | 22986.22 (12814.67-33890.22) | -58.49 | 480.01 (273.37-734.23) | Al trained 20.92 (80.10-214.54) 20.92 (28.35-105.50) 20.52 (55.66-146.98) 20.52 (55.66-146.98) | -79.2 |
| Smoking | 55561.50 (51506.65-64009.20) | 22/00.22 (12014.07-330/0.22) | -30.47 | 400.01 (275.57-754.25) | ng g | -1).2 |
| Male | 34317.44 (19894.39-54836.53) | 15474.57 (8686.80-23623.93) | -54.91 | 581.11 (338.60-930.65) | | -75.7 |
| Female | 21064.12 (7035.82-39071.66) | 7511.65 (3425.62-12761.83) | -64.34 | 374.51 (122.68-703.54) | and 170.92 (80.10-214.54) 2.02 (28.35-105.50) | -83.4 |
| Both | 55381.56 (31368.85-84009.28) | 22986.22 (12814.67-33890.22) | -58.49 | 480.01 (273.37-734.23) | | -79.2 |
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| | monstrates a clear trend of the | e increasing rate of deaths and | DALYS | attributable to tobacco v | wigh and increase in age. I | rom |
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| figure 3, it i | s apparent that NCDs are res | ponsible for most deaths and c | lisability | attributable to tobacco | use. Agence Bibliographique de I | 1 |

BMJ Open The attributable deaths from cardiovascular diseases at all ages due to tobacco increased (73.5%) from 5738 (95% UI 4645-7011) in 1990 to 9944 (95% UI 7888-12158) in 2017 in both sexes, with more deaths occurring from tobacco smoking. The DALY for all ages from cardiovascular diseases due to tobacco use increased (56.9%) from 157642 (95% UI 126776-19355 m in 1990 to 247341 (95% UI 194740-303139) in 2017 in both sexes, with tobacco smoking the major cause of disability. Over the sange time period, all ages deaths and DALYs from cardiovascular diseases showed rising trends in both sexes due to tobacco smoking and second-hand smoking. The age-standardized deaths from cardiovascular diseases showed falling trends in both sexes due to tobac **deaths** (of all types), tobacco smoking, and in females due to second-hand smoking, while age-standardized deaths showed increasing lights in males from secondhand smoking. The age-standardized DALYs from cardiovascular diseases showed falling trends in both Bexes due to tobacco use, ded from http:// rieur (ABES). nd data mining, tobacco smoking, and second-hand smoking.

Diabetes and kidney diseases

The attributable deaths at all ages from diabetes and kidney diseases due to tobacco increased (281.89%≱from 173 (95% UI 105-251) in 1990 to 662 (95% UI 423-933) in 2017 in both sexes, with almost similar deaths occurring from tobaction in the second-hand 7240-16559) in 1990 to 29672 (95% UI 18547-41567) in 2017 in both sexes, with a disability resulting fram smoking and second-hand smoking in similar manner. Over the same period, all age deaths and DALYs from diabetes and kidney diseases showed rising trends in both sexes due to tobacco smoking and second-hand smoking. Similarly, age-standardized deaths and DABY sfrom diabetes and kidney diseases showed rising trends in both sexes due to tobacco use, tobacco smoking, and second-hand smoking. Neoplasms

The attributable deaths at all age deaths from all neoplasms due to tobacco increased (79.75%) from 2309 (95% UI 1829-2855) in 1990 to 4151 (95% UI 3336-5025) in 2017 in both sexes, with deaths occurring mostly from tobacco smoking. The DALYs for all ages from neoplasms due to tobacco increased (605.13%) from 61683 (95% UI 48393-76294) in 1990 to 94213 (95% @I 74227-114859) in 2017

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 BMJ Open in both sexes, with a disability resulting mainly from tobacco smoking. Over the same period, all age deaths and all age DALYs from all neoplasms showed rising trends in both sexes due to tobacco smoking, chewing tobacco, and secosdhand smoking. While, agestandardized deaths and age-standardized DALYs from all neoplasms showed falling trends in both sex & due to tobacco use, tobacco smoking, chewing tobacco, and secondhand smoking.

Non-communicable diseases

The attributable deaths at all ages from NCD due to tobacco use increased (86.94%) from 14490 (95% 司 월 2108-17316) in 1990 to 24323 (95% UI 20523-28033) in 2017 in both sexes, with deaths occurring mostly from tobacco smoking the DALYs for all age from noncommunicable due to tobacco use increased (52.58%) from 407804 (95% UI 341565-482687) In 199 🛱 🗟 22236 (95% UI 521552-724025) in 2017 in both sexes, with disability mostly resulting from smoking. Over the same period, all age Beaths and all age DALYs from NCDs showed rising trends in both sexes due to tobacco smoking, second-hand smoking, and chewing tobaccowhile the agestandardized deaths and DALYs from NCDs showed falling trends in both sexes due to tobacco use, tobac b showing, chewing tobacco, and second-hand smoking.

Tuberculosis

The attributable deaths at all ages from tuberculosis due to tobacco use decreased (53.77%) from 1733 (25% UI 962-2696) in 1990 to 801 (95% UI 446-1198) in 2017 in both sexes, with deaths occurring mostly from tobacco smoking. The DALYs for all age from noncommunicable due to tobacco use decreased (58.49%) from 55382 (95% UI 31369-84009) In 1990 to 22986 (95% UI 12815-33890) in 2017 in both sexes, with disability mostly resulting from smoking. Similarly, all age and age-standard deaths and DALYs from tuberculosis showed falling trends in both sexes from tobacco use and tobacco smoking. Agence Bibliographique de l

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 Figure 2: Age-wise deaths (A) and DALYs (B) rates in all causes in both sexes attributable to tobactor, Figure 3.
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 Figure 3: All-age deaths (A) and DALYs (B) from different diseases attributable to tobacco use (in types) in Nepal in

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DISCUSSION

Prevalence and patterns of tobacco use

The GBD study results indicate that throughout the time between 1990 and 2015, the prevalence of daily to facco smoking in all ages significantly decreased by 15% in male (42% in 1990 and 27% in 2015), by 11% in female (24% in 1990 and 33% in 2015) and by 13% in the general population (33% in 1990 and 20% in 2015). On the other hand, the STEPS survey conducted in Nepal in 2019 showed no significant decrease in the prevalence of the overall use of tobacco in 2019 compared with 2013.⁵ One Reason for the decrease in the prevalence of daily tobacco use could be Nepal's implementation of WHO FCTC in 2006¹³ and Tobacce Control and Regulatory Bill in 2011⁵, which regulate the law of tobacco use in Nepal. In reviewing previous literature, it is evident that gender, geographical and socio-economic variation do play a role in observed difference in the pattern of tobacco use. In Nepal, the two of tobacco products is practiced extensively in the elderly population, males, people with lower education levels, rural areas, mg inous areas than in plain areas, and Far- and Mid-western regions than in Eastern, Central, and Western regions.¹⁸ In addition to that, in Nepal, people in mountainous areas tend to smoke more while, people in plain areas tend to chew tobacco more.^{18,19} Elderly pesple have different beliefs around tobacco use, like continuing tobacco does no harm, and stopping tobacco does not improve health status.²⁰ People who are less educated might have a lower level of awareness of the harmful hazards of tobacco use. However, in recent **B** mes, males of the young

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BMJ Open age group have high tobacco consumption.⁶ A similar pattern of variation in tobacco use was noticed in the Southeast Asian population. The higher prevalence of smoking in males was observed in Asian countries like Malaysia, Philippines, Sagabore, Vietnam, Indonesia, Maldives, and Bangladesh.^{21,22} In these countries, gender seems to be an important determinant of the initiation of the smoking habit and for perpetuating it. Social norms and the prohibition of tobacco use can be one of the factors responsible for the lower prevalence of tobacco use in the female population in Southeast Asian countries.²³ Smokeless form of tobacco was comparison in countries like India, Nepal, Bangladesh, Maldives, and Cambodia.²² Increasing age, poverty, and poor education were associated with higher consumption Downloaded f nent Superieur I to text and da of tobacco in these countries.

Deaths and DALYs attributable to tobacco

Tobacco use was the second most common risk factor for deaths and the third most common risk factor be total DALY in Nepal in 2017.²⁴ In numbers, 14.73% (95% UI 12.52-16.58) of total deaths and 7.8% (95% UI 6.68-9.06) of total deaths and 7.8% (95\% UI 6.68-9.06) of total deaths tobacco use in 2017.²⁴ In between 1990 and 2017, the total deaths attributable to tobacco use, including any form, in all ages increased by 39% in the general population (both males and females) and DALYs attributable to tobacco use, in all ages increased by 11% males but decreased by 9% in females, with tobacco smoking having the most contribution Also, in 2017 most of the tobacco attributable deaths were due to cardiovascular disease, diabetes, neoplasm, and kidney disease. Between 1990 and 2017 tobacco attributable disease occupied a larger proportion of cause of death in Nepal. In contrary to an overall a larger proportion of cause of death in Nepal. tobacco use in both males and females in recent decades, the total deaths and DALYs were higher in 2017 sompared with 1990. One plausible explanation for this pattern could the population growth in Nepal, 29 million in 2019 compare with 18.9 million in 1990.²⁵ The rising number of tobacco consumers despite the overall decrease in the prevalence of tobacco use can be attributed to population growth compared with 1990. Furthermore, the elderly population tends to have smoked for more decade considering they started consuming tobacco from an early age. Thus, they tend to have the highest exposure to tobacco which can suppart a fact that the mortality attributable to tobacco becomes evident usually after the two to three decades of tobacco use.²⁶ This evidence also explains the reason

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BMJ Open why there are increasing deaths and disabilities with an increase in age.[Fig. 2] Consequently, the deaths and disabilities with an increase in age.[Fig. 2] Consequently, the deaths and to to bacco use may continue to rise in the long run despite the decrease in the prevalence of tobacco use. Trends of different forms of tobacco Smoking In 2017, smoking was the second most common leading cause for death and third for risk attributable increase in the prevalence of tobacco use in the death and third for risk attributable increase in the prevalence of tobacco use.

 decrease in the prevalence of smoking from 1990-2017, there was a considerable increase in the death and LikeLY attributed to tobacco.

Smokeless tobacco It was evident from the results that, age-standardized rates of death and disability due to smokeless tobacco however, the absolute number of deaths and disabilities due to smokeless tobacco is in increasing pattern. If recent years in the Southeast Asia region, including Nepal, there is a clear increase in preference to using of smokeless tobacco over to Bace smoking, with a higher prevalence of smokeless tobacco in males.^{6–8,27} Smokeless tobacco is associated with a higher risk of getting cancer²⁸ and cardiovascular risk factors like hypertension, metabolic syndrome, and cardiovascular events like acute coronary syndrome? than non-tobacco users, although less than tobacco smoking. The increased prevalence of smokeless tobacco in the Nepalese population and the potential increase in the risk of cancer associated with it might be the reason for the increase in disability rate from all neoplasms due to chewing tobacco. According to a study in Nepal, most of the consumers of smokeless tobacco are unaware of its harmful Bealth hazards.³⁰ Studies have shown that smokers tend to perceive smokeless tobacco less harmful than smoking.³¹ This belief might existence and smokers in Nepal and the extent of such beliefs needs to be explored in detail. The production of smokeless tobacco products is unhindered in Nepal and the increased import of smokeless form neighboring country, India made the products easily accessible algover the country.³⁰ And, owing to the government's lower taxation imposed on smokeless products compared with smoking tobacco products, smokeless tobacco products have an added affordability.⁶ Tobacco products such as bidis and smokeless tobacco are perceived a their added affordability.⁶ Tobacco products such as bidis and smokeless tobacco are perceived a more informal nature. Thus, all these factors with more emphasis of tobacco control policy on tobacco smoking over smokeless tobacco

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 with lack of awareness towards the hazards of smokeless tobacco products seems to be the cause for shifting the preference of consumers from smoking to smokeless tobacco.
 Preference of consumers

 Second-hand smoking
 The results indicate that the age-standardized rates of death among males due to cardiovascular diseases
 age-standardized deaths

and disability due to diabetes and kidney diseases in both sexes, attributable to second-hand smoking ar and be increasing pattern. At the global level, around 40% of children, 33% of male non-smokers, and 35% of female non-smokers are estimated to have been exposed to second-hand smoke regularly, with Southeast Asia and Western Pacific region accountable for 50% of the globe's total burden from second-hand smoke exposure.³² Most of the deaths attributable to second-hand smoke occurred from is the least disease in adults and lower respiratory tract infections in children, women having the greatest burden among all. Most DA hand smoke exposure occurred due to lower respiratory tract infections and ischemic heart diseases, children being the most affected ones.³² In Nepal, public transports and restaurants are the major areas of second-hand smoke exposure in Aublic places, while home and workplaces are indoor areas of second-hand smoke exposure.⁵ aining, and simila pen.bmj.com/ on

Policy related to tobacco in Nepal:

In response to the global tobacco epidemic, WHO launched a global public health treaty in 2003 named WHO framework convention on tobacco control (WHO FCTC).³³ Nepal signed the WHO FCTC in 2003 with the ratification of the treaty in 2006.¹³ In 2008, to efficiently implement the FCTC, WHO launched the MPOWER policy to lower the tobacco demand in individual countries,³⁴ which was adopted by Nepal. The Parliament of Nepal passed the Tobacco Control and Regulatory Bill in 2011 incorporating the provisions of WHO FCTC which is currently the primary law that governs tobacco use. This act regulates the use of tobacco in public workplaces and public transport, advertisement and promotion of any kind of tobacco products, and packaging and labaring of tobacco products. However, the question that arises is how effective the law is, and how effective we have been in protecting beople from tobacco use,

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BMJ Open tobacco-related deaths, and disability. The decreasing trends in the prevalence of tobacco use and age-standardized deaths and DALYs attributable to tobacco suggest that tobacco control has been effective so far. Nepal received a Bloomberg philanthropies Award for Global Tobacco Control in 2015 for its work in control and reduction of tobacco products use by warning people about the hazards of tobacco use.³⁵ The tobacco act has emphasized more on packaging and promotion to abate the consumption of tobacco products. In the STEPS survey conducted in 2019, 75.7% of adults noticed health warnings on tobacco packages and 44.8 2.5 current users thought of quitting because of such warning. However, the tobacco act is limited by lack of knowledge on the imperiation of regulations in public places and around the educational hubs. Though the control of tobacco use in Nepal appears we detail hubs. Though the control of tobacco use in Nepal appears we detail hubs. progress seems static in recent times. The STEPs survey conducted in Nepal in 2019 showed only a mide alrop in the prevalence of former smokers or former smokeless tobacco users in comparison to 2013.⁵ Tobacco control, not only a full ributes to improving the health of its consumers but also is very important for the economic development. On average, the average and out of money spent per year on cigarettes is around 11% of GDP per capita.⁵ ng, Al train

Limitations of study

There are a few limitations to the study. First, we took the data from the Global Burden of Disease database. Hence, the limitations pertaining to the data elsewhere in the literature also apply to our study. Second, the prevalence of shoking could have been underestimated as the GBD data only takes into account the prevalence of daily smoking and lacked the data for the prevalence of smokeless tobacco and second-hand exposure. This could have resulted in an underestimation of overall provalence.

CONCLUSIONS

This study is one of the first studies in Nepal to show the effect of using tobacco on mortality and DALY. Despite the prevalence of tobacco smoking decreasing in the time between 1990 and 2015, there was a more than one-third increase in more than a 3% increase in DALY. Most deaths and disabilities attributable to tobacco use were NCDs. There is a huge increase in deaths and DALY due to

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 BMJ Open chewing tobacco from 1990 to 2017. Despite Nepal's government commitment to the FCTC, there is still much that needs to be done for effective control of tobacco use in Nepal. Awareness and control strategies should focus on all forms bacco including secondon 23 August 2021. Downloaded from ht Enseignement Superieur (ABES ing for uses related to text and data min hand exposure.

Conflict of interest

The authors declared that they have no conflict of interest.

thors decia... tributorship statement ambhir Shrestha: Conceptualization, Methodology, Software, Formal analysis, Supervision, Writing-Original draft preparation. Prabin Phuyal: Software, Formal analysis, Visualization, Writing-Original draft preparation. Rabin Gautam: Conceptualization, Methodology, Software, Formal analysis, Writing-Original draft preparation. 'Mulmi: Conceptualization, Visualization, Writing-Reviewing and Editing. ' ~'' Visualization, Writing-Reviewing and Editing. Gambhir Shrestha: Conceptualization, Methodology, Software, Formal analysis, Supervision, Writing-Orginal draft preparation. :om/ on June 12, 2025 at Age

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| Data | BMJ Open by copyright, inc sharing statement inc 48 | |
| | data used in this study is freely available from The Institute for Health Metrics and Evaluation (IHM) 'S Global Burden of ase (GBD) database. | |
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| We we this s | would like to thank The Institute for Health Metrics and Evaluation (IHME)'s Global Burden of Disc State (GBD) for the data for study. | |
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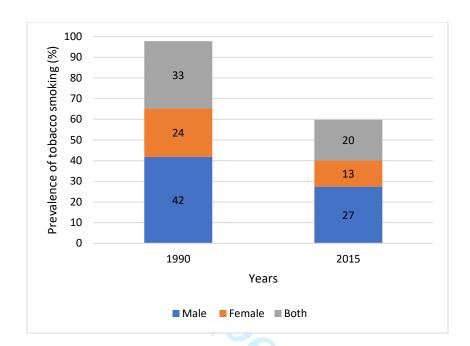
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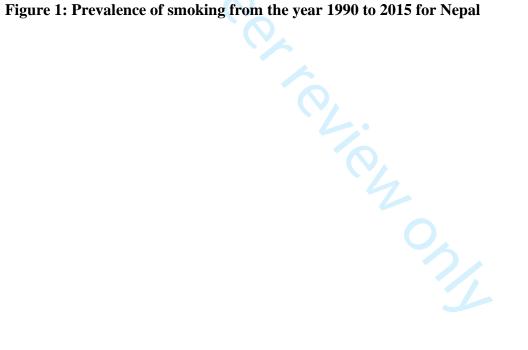
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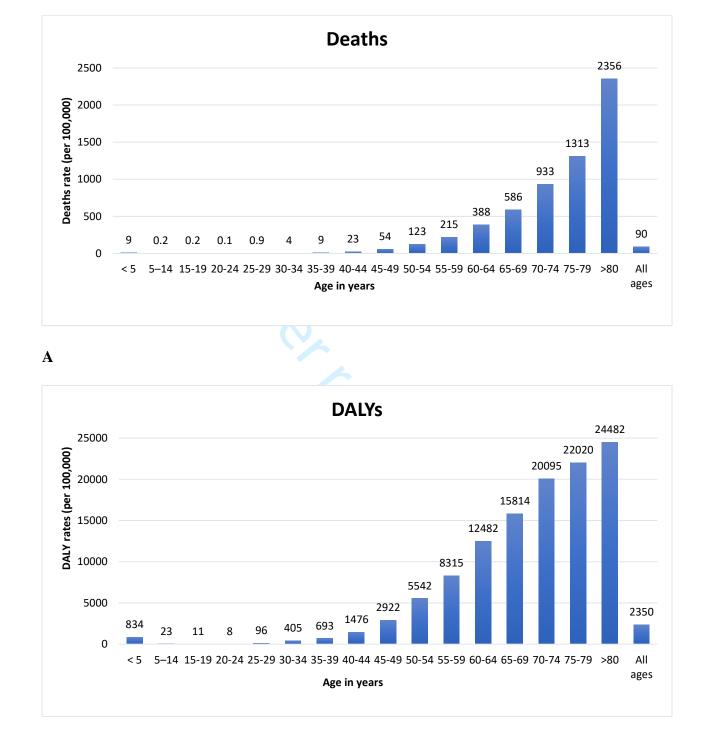
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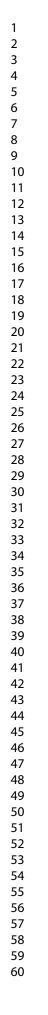
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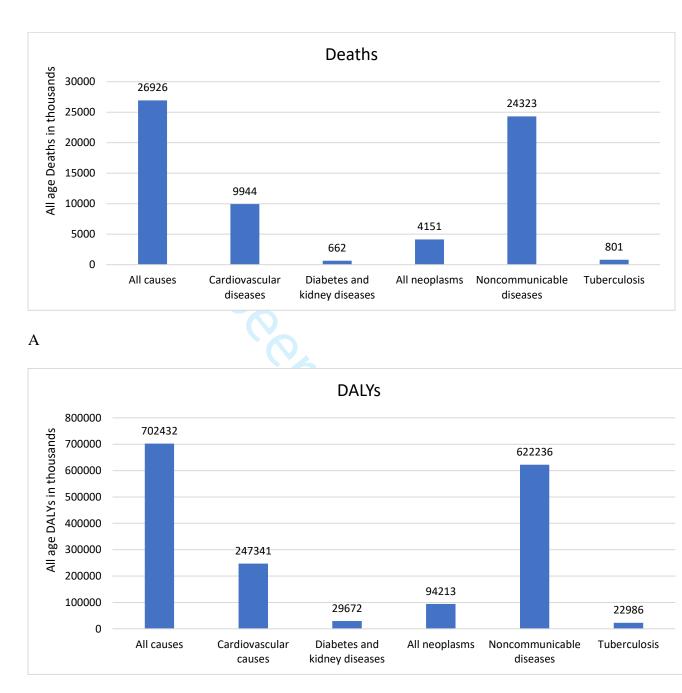


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Figure 2: Age-wise deaths (A) and DALYs (B) rates in all causes in both sexes attributable to tobacco, including all types, in 2017

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Figure 3: All-age deaths (A) and DALYs (B) from different diseases attributable to tobacco use (including all types) in Nepal in 2017

Depression among Inmates in a Regional Prison of Eastern Nepal: A Cross-Sectional Study

STROBE Statement—Checklist of items that should be included in reports of cross-sectional studies

| | Item No | Recommendation | Please insert check where included or N/A where no applicable |
|------------------------|------------|---|---|
| Title and abstract | 1 | (<i>a</i>) Indicate the study's design with a commonly used term in the title or the abstract | |
| | | (<i>b</i>) Provide in the abstract an informative and balanced summary of what was done and what was found | |
| Introduction | | | |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported | \checkmark |
| Objectives | 3 | State specific objectives, including any prespecified hypotheses | \checkmark |
| Methods | | | |
| Study design | 4 | Present key elements of study design early in the paper | \checkmark |
| Setting | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | \checkmark |
| Participants | 6 | (<i>a</i>) Give the eligibility criteria, and the sources and methods of selection of participants | NA |
| Variables | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | \checkmark |
| Data sources/ | 8* | For each variable of interest, give sources of data and details of methods | \checkmark |
| measurement | | of assessment (measurement). Describe comparability of assessment | |
| | | methods if there is more than one group | |
| Bias | 9 | Describe any efforts to address potential sources of bias | |
| Study size | 10 | Explain how the study size was arrived at | |
| Quantitative variables | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why | \checkmark |
| Statistical methods | 12 | (<i>a</i>) Describe all statistical methods, including those used to control for confounding | |
| | | (b) Describe any methods used to examine subgroups and interactions | |
| | | (c) Explain how missing data were addressed | N/A |
| | | (<i>d</i>) If applicable, describe analytical methods taking account of sampling | N/A |
| | | strategy | |
| | | (<u>e</u>) Describe any sensitivity analyses | N/A |
| Results | | | |
| Participants | 13* | (a) Report numbers of individuals at each stage of study—eg numbers | \checkmark |
| | | potentially eligible, examined for eligibility, confirmed eligible, included | |
| | | in the study, completing follow-up, and analysed | |
| | | (b) Give reasons for non-participation at each stage | NA |
| | | (c) Consider use of a flow diagram | - |
| Descriptive data | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders | \checkmark |

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| | | (b) Indicate number of participants with missing data for each variable of interest | ٧ |
|-------------------|-----|---|---|
| Outcome data | 15* | Report numbers of outcome events or summary measures | ١ |
| Main results | 16 | (<i>a</i>) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | ٦ |
| | | (b) Report category boundaries when continuous variables were categorized | - |
| | | (<i>c</i>) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period | - |
| Other analyses | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses | ٦ |
| Discussion | | | |
| Key results | 18 | Summarise key results with reference to study objectives | ٧ |
| Limitations | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias | ٦ |
| Interpretation | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | ١ |
| Generalisability | 21 | Discuss the generalisability (external validity) of the study results | ١ |
| Other information | | | |
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | ٦ |
| | | | |

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The burden of tobacco in Nepal: a systematic analysis from the Global Burden of Disease Study 1990-2017

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e burden of tobacco in Nepal: a systematic analysis from the Global Burden of Line and the systematic analysis from the systematic analysis f BMJ Open

- 4. Department of Cancer Prevention, Control and Research, B.P. Koirala Memorial Cancer Hospital, Chievan Nepal

/ on June 12, 2025 at Agence Bibliographique

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 Abstract
 Solution

 Objective: This study attempts to systematically review the data extracted from the global burden disease
 and set out to assess the

 age-sex-specific mortality and disability attributable to different forms of tobacco from 1990 to 2017, for Negal.

Design: This cross-sectional study extracted data from the Institute for Health Metrics and Evaluation study extracted data from the Institute for Health Metrics and Evaluation database, then was quantitatively analyzed to show the trends and patterns of prevalence of tobacco use, de al DALYs attributable to tobacco use from different diseases from the year 1990 to 2017 in Nepal.

Setting: Nepal.

Results: In between 1990 and 2015, the age-standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking decreas Results and a standardized prevalence of daily tobacco smoking daily tobacco smoking daily tobacco s females, and 28% in both. By 2017, the age-standardized mortality rate and DALYs attributable to tob decreased by 34% and 41% respectively, with tobacco smoking having the most contribution. However, the solute number of deaths and DALYs increased by 39% and 3% respectively. An increasing rate of deaths and DALYs attributable bacco was noted with an increase in age. Non-communicable diseases were responsible for most deaths and disabilities attributable to sobacco use.

Conclusion: The prevalence of smoking along with the age-standardized mortality rate and DALYs shows decreasing trend. However, attention should be made to implement a strong plan to control all forms of tobacco including second-hard exposure. echnologies

Keywords: tobacco; global burden of diseases; Nepal; DALY.

Strengths and limitations of this study

This study is one of the first studies in Nepal to extracts Global Burden of Disease Study data to presenentationally representative • liographique de l data on mortality and disability attributable to tobacco by age, sex, and disease.

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- This study analyses the secondary data of the Global Burden of Disease Study and hence it has a $\mathbf{\bar{E}}$ the limitations pertaining to • the data.
- The prevalence of smoking could have been underestimated as the Global Burden of Disease data by takes into account the . prevalence of daily smoking and lacked the data for the prevalence of smokeless tobacco and second-hand exposure.

INTRODUCTION To date, tobacco remains a major public health issue worldwide because of its associated high morbidity and morbidity rate. Any forms of tobacco use are harmful to health and kill millions of people every year.¹ The use of tobacco products **H** smokeless or exposure to second-hand smoke has been implicated in many health issues like cardio vascalar diseases, respiratory diseases, cancers, non-communicable diseases (NCD), and many more.^{2,3} There is no safety margin for expositive to second-hand smoke or tobacco smoking and second-hand smoke exposure is equally harmful to health.

According to the World Health Organization (WHO), about 1.3 billion people in the world used tobaccon products among which more than one billion people were smokers.⁴ Almost 80% of smokers reside in low- and middle-income countr $\mathbf{\bar{e}}$ s. **T** he last two decades have seen a decreasing trend towards the consumption of tobacco in all age groups. In 2000, almost one-thad a f the world's population (33.3%) aged 15 and more used some form of tobacco products, 50% in males and 16.7% in females. While the 2015, the prevalence of tobacco use dropped to nearly a quarter of the world's population (24.9%), 40.3% in males and 9.5% in fergales¹ Despite the decreasing prevalence of tobacco use globally, the absolute number of male smokers is growing continuously in South East Asian, African, and Eastern Mediterranean regions. The South-East Asian region has the highest prevalence of tobacco use (31% in 2015) compared with other regions, 49.4% in males and 12.9% in females.¹ According to recent findings from STEPS survey 201² in Nepal, around 29% of adults (48% male and 12% female) within the age group 15-69 years used any form of tobacco.⁵ In recent tites, people have shown a

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 BMJ Open growing preference for smokeless tobacco over smoking in South-East Asia including Nepal.^{6–8} In Nepal is much more common than tobacco smoking and is more prevalent among males (33%) compared with \mathbf{E} matrix (5%).⁵

Despite decreasing prevalence, the number of deaths due to tobacco use continues to rise. Tobacco kills more than 8 million people every year. Among them, about 7 million people die from direct tobacco use while the deaths of about 122 illion people result from second-hand smoke exposure.⁴ In 2015, smoking alone was responsible for 11.5% and 6% of global deated disability-adjusted life years (DALYs) respectively.⁹ Deaths of about 65,000 children per year can be attributed to exposure to second and smoke.⁴ The recent estimates show around US\$ 1.4 trillion of total economic loss results globally from tobacco use which gig Equivalent to 1.8% of the world's annual GDP.¹⁰ About 40% of this cost occurred in developing countries. In Nepal, around 27 the and deaths occur annually ur (AB) data m from tobacco use, which comprises about 14.9% of all deaths.¹¹

Given such a significant negative impact of tobacco on public health, navigation of the outcomes of tobacca in a low-income country like Nepal is of the essence. The issue of tobacco usage has received considerable attention. In response, Repal implemented the WHO Framework Convention on Tobacco Control in 2006¹² and passed Tobacco Control and Regulatory Bill is 2011 by Parliament⁵. So far, however, there has been little discussion about trends and patterns of tobacco use and its outcomes in Negal Such approaches have an unsatisfactory description of the burden of tobacco in the Nepalese population. This study systematically reviews the data extracted from the global burden disease study 2017 and sets out to assess the trends in prevalence, mortality, and disability attributable to different forms of tobacco in Nepal from 1990 to 2017. Therefore, the findings of this study will make a major contribution informing the policymakers and public health professionals by providing important insights into evidence for an effective tobacco control program in 025 at Agence Bibliographique de l Nepal.

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 morbidity and mortality in 195 countries from major injuries, diseases, and risk factors to health at the global regional and national level. The study design, metrics, and analysis are published elsewhere.¹³ The Institute for Health Metrics **b** Caluation (IHME) coordinated the GBD study 2017 and used the data from several published and unpublished literature, surveillance data, hospital and clinics data to estimates the deaths and disability attributable to 84 risk factors for 195 countries by age and sex.^{13,14}

The Nepal GBD 2017 study utilized data from over 90,000 sources covering the years between 1990 and 2013. These data sources included in Nepal's burden of disease estimates mainly data from the 1971–2011 Nepal Population and Busing Census, disease registries such as the Kidney Disease Data Centre maintained by the International Society of Nephropath, endemiological surveillance such as the WHO Disease Observatory, periodic and ad hoc large household surveys such as The al Demographic Health Surveys, Multiple Indicator Cluster Surveys (MICS), and Nepal STEPS Non-Communicable Risk Factor Burgeys, Nepal Global Youth Tobacco Survey, Nepal Behavioral Surveillance Survey, Nepal Hospital Inpatient Discharges Recerd, Health Management similar Information System (HMIS), published scientific literature, reports, and administrative records.¹⁵

The GBD database was used for the extraction of data related to mortality and DALYs of all causes and other finajor public health issues of Nepal like cardiovascular diseases, NCDs, diabetes, and kidney disease, all neoplasms including benign and malignant, and ogies. 2025 at Age tuberculosis from the year 1990 to 2017.¹⁶

Patient and public involvement statement

This study used the data freely available from The Institute for Health Metrics and Evaluation (IHME)'s GB database. Patients were not involved in the design, recruitment, or conduct of the study. Results of this study will be made publicly ava $\mathbf{\bar{B}}$ able through publication.

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 by copyright, inclusted by provide the number of deaths at each age by a standard life extension of the standard life extension of Years lived with disability (YLDs) is the number of years of life lived with health loss weighted by the severity of the disabling sequelae of diseases and injuries. DALY is the key summary measure of population health used in GBD B antify health loss which allows comparison of health loss across different diseases and injuries. They are a measure of the number wears of healthy life that are lost due to death, nonfatal illness, or impairment, and thus, they are calculated as the sum of YLLs an $\frac{2}{3}$ $\frac{2}{3}$ $\frac{1}{3}$ Ds.^{14,17}

Uncertainty interval (UI) is a range of values that is likely to include the correct estimate of disease burden a given cause. Narrow uncertainty intervals indicate that evidence is strong, while wide uncertainty intervals show that evidence

The term tobacco includes tobacco use in all forms either smoking or smokeless or both.

Statistical analysis

The extracted data from IHME were imported into Microsoft Excel, then were quantitatively analyzed $a\mathbf{\vec{B}}$ desented in the graphical, tabular forms and histograms to show the trends and patterns in age-sex-specific mortality and DALYs in Nepal. The age-standardized prevalence of tobacco use only in form of daily tobacco smoking was available up to the year 2015. A perenting e change was calculated to present the difference in mortality and DALYs between 1990 and 2017. An uncertainty interval of 95 as presented to show the technologies ine 12, 2025 at Age strength of the estimates.

RESULTS

Here we report the GBD study results for Nepal on the prevalence of tobacco use, mortality, and burden caused by different forms of bliographique de l tobacco, smoking, and smokeless tobacco, between 1990 and 2017.

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 Tobacco smoking Tobacco smoking is in decreasing trend during the period 1990 to 2015 in both sexes.
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 prevalence of tobacco smoking at all ages was 27.5% for both sexes. The prevalence was more for mates (35.6%) than the females (19.8%). In 2015, the prevalence of tobacco smoking decreased to 19.7% in both sexes at all ages, with mathematical sector and female 10.3% t 2021. Downloaded from http://b eignement Superieur (ABES) . related to text and data mining, / [Figure 1].

Figure 1: Prevalence of smoking from the year 1990 to 2015 in Nepal

Deaths and DALYs

In Nepal, both the age-standardized mortality rate and the DALY's attributable to tobacco are in decreasing trend from 1990 to 2017 [Figure 2]. The age-standardized attributable deaths to tobacco use, including all forms, decreased (34.5%) in the general population from 216 (95% UI 183-258) per 100,000 in 1990 to 141 (95% UI 120-163) per 100,000 in 2017. While DEALY's decreased by 41.3% from 5474 per 100,000 in 1990 to 3216 per 100,000 in 2017. This finding was found in both males and females. Similarly, over the same time, the age-standardized deaths and DALYs attributable to tobacco smoking, chewing tobacco, second-hand smoking, showed a falling trend for both sexes and males and females separately [Table 1]. In absolute terms, the attributable deaths at all ages to tobacco use, including all forms, increased (38.99%) in the general population (both male and female) from \$372 (95% UI 16060-23310) in 1990 to 26926 (95% UI 22826-31135) in 2017. While DALYs for all ages due to tobacco use increased (10.52%) in males from 403665 (95% UI 319794-512870) in 1990 to 446132 (95% UI 364622-524648) in 2017, it decreased (8278%) in females from 280977 (95% UI 205487-373384) in 1990 to 256301 (95% UI 205569-316573) in 2017 [Supplementary Tabe 1].

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Figure 2: Trend of age-standardized mortality rate and DALYs attributable to tobacco from 1990-201% in Nepal

| | 017 Age-Standardized De | aths, in Rates per 100,000 (95 ⁰ | %UI) | Age Standardized DA | <u>등</u> [文Ys, 3 n Rate per 100,000 (|
|--------------------|--|---|------------------|--|---|
| Subcategory | 1990 | 2017 | change, % | 1990 | for 23 2017 |
| All causes | | | | · | l E E D U U U U U U U U U U U U U U U U U |
| Tobacco | | | | | S S IS |
| Male | 258.31 (210.40-311.96) | 192.61 (157.59-222.97) | -25.44 | 6479.90 (5370.92-7761.64) | 1 1 1 1 1 1 1 1 1 1 |
| Female | 173.77 (132.36-221.72) | 97.55 (76.10-122.53) | -43.86 | 4417.82 (3434.48-5521.70) | #20.59 71 (1807.00-2790.11) |
| Both | 216.59 (183.28-258.18) | 141.95 (120.86-163.38) | -34.46 | 5474.76 (4575.91-6509.77) | 3 316 40 (2731.40-3706.93) |
| Smoking | | 6 | | | |
| Male | 233.81 (188.33-287.71) | 173.70 (140.69-202.11) | -25.71 | | £ 3 2 6 <u>3</u> .43 (3080.63-4416.59) |
| Female | 145.70 (107.91-191.96) | 82.34 (62.37-105.36) | -43.49 | 3280.63 (2506.14-4233.47) | a 19 19 . 83 (1404.38-2286.84) |
| Both | 190.28 (157.79-229.81) | 124.98 (104.95-145.25) | -34.32 | 4397.13 (3669.32-5255.62) | a2736.68 (2284.27-3196.91) |
| Chewing | | | | | |
| tobacco | 6.27 (4.33-8.66) | 5.88 (4.11-7.71) | -6.16 | 168.65 (114.63-236.68) | |
| Male | 3.50 (2.47-4.87) | 2.61 (1.89-3.45) | -25.46 | 73.41 (50.23-103.75) | B B 2 .22 (37.00-70.13) |
| Female | 4.94 (3.79-6.31) | 4.18 (3.24-5.21) | -15.49 | 122.55 (91.82-159.88) | 1 .91 (71.42-119.17) |
| Both | | | | | ng, - <mark>p</mark> |
| Secondhand | | | | | A |
| smoking Male | 20.06(10.22.41.14) | 21 46 (15 19 29 02) | -26.17 | 1086 43 (672 07 1625 06) | tra 5 2 .55 (390.79-739.73) |
| Female | 29.06 (19.32-41.14) 32.52 (20.82-48.22) | 21.46 (15.18-28.93) 16.96 (11.54-23.68) | -20.17 -47.84 | 1086.43 (673.97-1635.96) 1224.70 (741.83-1844.80) | a. 349.55 (390.79-739.73) n 480.98 (332.88-653.52) |
| Both | 30.79 (20.61-43.63) | 19.07 (13.58-25.41) | -47.84 -38.06 | 1154.42 (715.21-1723.62) | tai 5.55 (390.79-739.73) 480.98 (332.88-653.52) 513.66 (368.38-681.62) |
| Dom | 50.77 (20.01-45.05) | 17.07 (13.30-23.41) | -38.00 | 1137.72 (113.21-1/23.02) | |
| Cardiovascular | diseases | | | | nd j.co |
| Tobacco | | | | | sir m/ |
| Male | 79.77 (62.88-100.16) | 72.14 (55.43-87.12) | -9.56 | | 1 164 5 .74 (1249.24-2025.45) |
| Female | 44.72 (32.51-60.62) | 25.56 (18.65-33.50) | -42.84 | 1031.71 (759.76-1395.12) | a 5 5 3.31 (436.90-754.23) |
| Both | 62.60 (50.60-76.99) | 47.59 (37.76-58.00) | -23.99 | 1496.61 (1211.38-1833.80) | § 10 § .61 (864.04-1335.54) |
| Smoking | | | | | hr et |
| Male | 72.05 (56.17-91.65) | 63.81 (48.14-78.29) | -11.43 | 1764.47 (1368.64-2229.23) | D 1466.62 (1100.22-1816.26) |
| Female | 37.58 (26.31-52.83) | 21.28 (15.00-28.47) | -43.37 | 866.98 (622.05-1191.46) | 6 487.20 (350.81-645.50) |
| Both Secondhard | 55.18 (43.64-69.61) | 41.42 (32.17-50.97) | -24.94 | 1328.36 (1051.46-1644.91) | gie 958 25 (741.81-1176.85) |
| Secondhand | | | | | er at |
| smoking | 10.22 (7.50.12.00) | 10 55 (7 71 12 70) | 2.12 | 220.06 (170.65.225.91) | Þ |
| Male Female | 10.33 (7.50-13.98) 8.93 (6.42-12.28) | 10.55 (7.71-13.79) 5.15 (3.72-6.88) | 2.12 -42.30 | 239.06 (170.65-325.81) | 2 9 7.07 (164.09-318.59) 1 2 7.97 (83.21-157.40) |
| Both | 9.63 (7.30-12.52) | 5.15 (5.72-6.88) 7.68 (5.71-9.91) | -42.30 -20.28 | 209.45 (149.20-289.64) 224.55 (167.63-294.69) | 1794.52 (127.17-225.73) |
| Dom | 9.05 (7.50-12.52) | /.08 (3./1-9.91) | -20.28 | 224.33 (107.03-294.09) | σ |
| Diabetes and ki | dnev diseases | | | | |
| Tobacco | uney ulbubbb | | | | ographique |

ange in

Change, %

| | | ВМЈ Ор | ben | | 36/bmjopen-2020 100.45 (100.86-216.42) 1100.45 (100.86-216.42) | Pa |
|--------------------|--------------------------------------|--------------------------------------|------------------|---|--|----------------|
| | | | | | jope | |
| | | | | | opy | |
| | | | | | ·2020 | |
| Male | 2.40 (1.24-3.52) | 4.04 (2.52-5.88) | 68.81 | 122.02 (76.26-170.75) | 19 .45 (100.86-216.42) | 27.40 |
| Female | 2.25 (1.08-3.91) | 3.36 (1.88-5.12) | 49.56 | 100.14 (56.08-152.06) | R 134.21 (65.15-166.66) | 14.05 |
| Both | 2.32 (1.40-3.39) | 3.68 (2.34-5.22) | 58.71 | 111.38 (69.92-157.69) | L 1 3 3.85 (84.28-188.70) | 20.17 |
| Smoking | | | | | lin on | |
| Male | 1.52 (0.79-2.35) | 2.49 (1.44-3.68) | 63.05 | 81.42 (48.91-117.42) | 1111111111111 | 18.78 |
| Female | 0.99 (0.44-1.80) | 1.39 (0.72-2.29) | 39.87 | 44.00 (23.92-69.99) | q 4 5.15 (25.44-69.43) | 2.61 |
| Both | 1.26 (0.73-1.84) | 1.90 (1.09-2.82) | 50.83 | 63.12 (39.32-92.22) | b c c c c c c c c c c | 10.23 |
| Secondhand | | | | | es | |
| smoking | | 1 78 (0 (5 2 0() | 72 70 | 47.97 (19.20.79.94) | | 40.04 |
| Male Female | 1.02 (0.37-1.76) 1.38 (0.47-2.58) | 1.78 (0.65-2.96) 2.12 (0.79-3.57) | 73.70 53.42 | 47.87 (18.20-78.84) 61.56 (22.44-103.23) | eigner 8:.04 (24.88-109.93) eater 1::04 (24.88-109.93) eater 1::04 (28.41-119.04) for 6::06 (26.68, 113.48) | 40.04 19.75 |
| Both | 1.38 (0.47-2.38) 1.20 (0.44-2.01) | 1.96 (0.74-3.16) | 63.59 | 54.62 (20.91-90.45) | 23 .72 (28.41-119.04) 29 .65 (26.68-113.48) | 29.34 |
| Dotti | 1.20 (0.44-2.01) | 1.90 (0.74-5.10) | 05.59 | 54.02 (20.91-90.45) | 0 2 0 | 29.34 |
| All Neoplasms | | | | | | |
| Tobacco | | | | | and .10 (461.65-774.18) | |
| Male | 30.95 (24.06-39.91) | 28.96 (22.83-37.32) | -6.44 | 719.64 (561.48-925.16) | ප් බිදි .10 (461.65-774.18) | -16.75 |
| Female | 19.39 (13.78-25.56) | 12.94 (9.36-16.79) | -33.27 | 449.04 (319.58-604.71) | a ₽ 64.74 (191.97-350.53) | -41.04 |
| Both | 25.33 (20.13-31.34) | 20.51 (16.50-24.68) | -19.00 | 588.97 (467.75-728.93) | តិ៍ 🔁 ខ្មី ^{1.87} (338.03-516.50) | -27.86 |
| Smoking | | | - 1 - | | B B B C .77 (383.81-659.25) | 17.50 |
| Male | 27.08 (21.06-35.75) | 25.14 (19.63-32.65) | -7.15 | 608.89 (473.84-798.63) | | -17.59 |
| Female | 16.42 (11.15-22.30) | 10.55 (7.22-14.28) | -35.75 | 379.46 (255.47-531.95) | G .2 D .28 (145.63-284.73) | -44.59 |
| Both | 21.87 (17.21-27.66) | 17.43 (13.68-21.32) | -20.30 | 498.15 (390.94-629.30) | ≥ ³ ³ .81 (272.49-429.49) | -29.78 |
| Chewing tobacco | 6.27 (4.33-8.66) | 5.88 (4.11-7.71) | -6.16 | 168.65 (114.63-236.68) | Ta 1.37 (97.27-186.23) | -16.18 |
| Male | 3.50 (2.47-4.87) | 2.61 (1.89-3.45) | -25.46 | 73.41 (50.23-103.75) | 2 .22 (37.00-70.13) | -28.87 |
| Female | 4.94 (3.79-6.31) | 4.18 (3.24-5.21) | -15.49 | 122.55 (91.82-159.88) | training, 91.37 (97.27-186.23) 92.22 (37.00-70.13) 94.91 (71.42-119.17) | -22.55 |
| Both | 4.94 (5.79-6.51) | 4.10 (5.24-5.21) | -15.47 | 122.55 (51.62-155.66) | | -22.33 |
| Secondhand | | | | | | |
| smoking | | | | | l si m | |
| Male | 0.45 (0.19-0.91) | 0.42 (0.19-0.78) | -7.22 | 10.32 (4.34-20.07) | <u>a</u> . o 8.81 (3.99-16.65) | -14.62 |
| Female | 0.71 (0.28-1.28) | 0.62 (0.26-1.08) | -12.63 | 19.02 (7.78-34.41) | $a_{16.60}$ (6.95-28.67) | -12.76 |
| Both | 0.58 (0.30-0.97) | 0.53 (0.27-0.87) | -9.13 | 14.61 (7.44-23.91) | 6 9 2.97 (6.68-20.93) | -11.21 |
| Non-communica | hla diagona | | | | and similar techno 12.97 (6.68-20.93) | |
| Tobacco | | | | | o N 0 N | |
| Male | 218.16 (173.73-265.37) | 175.89 (142.88-204.64) | -19.38 | 5073.68 (4093.17-6082.55) | 6 386 2 03 (3172.91-4519.86) | -23.76 |
| Female | 142.34 (104.66-187.72) | 86.99 (66.91-110.32) | -38.88 | 3221.12 (2456.18-4144.06) | 1984 ,52 (1586,27-2466,11) | -38.39 |
| Both | 180.75 (151.51-216.69) | 128.54 (108.71-148.12) | -28.88 | 4171.13 (3497.48-4911.28) | 2889.23 (2423.63-3338.29) | -30.95 |
| Smoking | | | | , , , , , , , , , , , , , , , , , , , | ý č | |
| Male | 201.54 (159.38-247.44) | 159.02 (128.76-185.87) | -21.10 | 4660.11 (3736.64-5631.05) | 346, 52 (2818.29-4056.89) | -25.74 |
| Female | 123.38 (88.81-165.96) | 74.07 (55.75-95.36) | -39.97 | 2750.38 (2049.71-3589.87) | 1654 40 (1277.75-2100.42) | -39.85 |
| Both | 162.93 (134.84-196.44) | 113.74 (94.11-132.80) | -30.19 | 3729.23 (3088.40-4466.96) | 251 3.85 (2093.96-2941.53) | -32.62 |
| Chewing | | | | | liö | |
| tobacco | 6.27 (4.33-8.66) | 5.88 (4.11-7.71) | -6.16 | 168.65 (114.63-236.68) | 191.37 (97.27-186.23) | -16.18 |
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| Male | 3.50 (2.47-4.87) | 2.61 (1.89-3.45) | -25.46 | 73.41 (50.23-103.75) | 4 .91 (71.42-119.17) | -28. |
| Female Both | 4.94 (3.79-6.31) | 4.18 (3.24-5.21) | -15.49 | 122.55 (91.82-159.88) | in 64.91 (71.42-119.17) | -22. |
| Secondhand | | | | | udi 7 c | |
| smoking | | | | | ng | |
| Male | 20.73 (13.44-29.41) | 19.10 (13.45-25.79) | -7.84 | 472.79 (313.93-651.81) | of 439.77 (311.91-580.57) | -6.9 |
| Female | 23.01 (14.20-34.45) | 14.46 (9.48-20.35) | -37.17 | 551.53 (358.70-804.61) | -3 -3 -3 -3 -3 -3 -3 -3 | -34. |
| Both | 21.88 (14.28-30.81) | 16.64 (11.75-22.37) | -23.92 | 511.51 (349.86-717.58) | S S S S S S S S S S | -21. |
| Tuberculosis | | | | | reig 20 | |
| Tobacco | | | | | 2021 elate | |
| Male | 20.61 (11.78-33.64) | 5.29 (2.98-8.12) | -74.34 | 581.11 (338.60-930.65) | | -75.2 |
| Female | 13.55 (4.08-27.10) | 2.43 (1.04-4.25) | -82.06 | 374.51 (122.68-703.54) | o nt 62.02 (28.35-105.50) xt 90.52 (55.66-146.98) | -83.4 |
| Both | 17.14 (9.42-27.10) | 3.78 (2.13-5.69) | -77.94 | 480.01 (273.37-734.23) | <u>E</u> <u>C</u> | -79.2 |
| Smoking | | | | | a pe | |
| Male | 20.61 (11.78-33.64) | 5.29 (2.98-8.12) | -74.34 | 581.11 (338.60-930.65) | ດັດ ໄ ດ ້0.92 (80.10-214.54) | -75.2 |
| Female | 13.55 (4.08-27.10) | 2.43 (1.04-4.25) | -82.06 | 374.51 (122.68-703.54) | a = 02.02 (28.55 - 105.50) | -83.4 |
| Both | 17.14 (9.42-27.10) | 3.78 (2.13-5.69) | -77.94 | 480.01 (273.37-734.23) | a A⊕.52 (55.66-146.98) ■ | -79. |
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| - | nstrates a clear trend of the are attributable to tobacco c | - | | | s a | Around |
| 27,000 deaths attributable to | are attributable to tobacco c tobacco use comprising 89% | comprising of 90% deaths of MALYs for NCDs [Figu | due to NCDs re 4]. | . Similarly, more than | with an increase in age. A 792,000 DALYs were | |
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| 27,000 deaths attributable to | are attributable to tobacco c tobacco use comprising 89% | comprising of 90% deaths of MALYs for NCDs [Figu | due to NCDs re 4]. | . Similarly, more than | with an increase in age. A . 752,000 DALYs were . 752,000 LALYs | |
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 by open view open vie smoking, and in females due to second-hand smoking, while age-standardized deaths showed increasing is in males from secondhand smoking. The age-standardized DALYs from cardiovascular diseases showed falling trends in back set to tobacco use, tobacco smoking, and second-hand smoking. The major cause of deaths and DALY in cardiovascular disease attributable to tobacco was found to be smoking.

Diabetes and kidney diseases

The attributable deaths and DALYs from diabetes and kidney diseases showed rising trends in both sexes to tobacco smoking and ://bmjopen.b second-hand smoking in both sexes. Al training

Neoplasms

The age-standardized deaths and age-standardized DALYs from all neoplasms showed falling trends in both seven due to tobacco use, similar technol m/ on June 1 tobacco smoking, chewing tobacco, and secondhand smoking.

Non-communicable diseases

The attributable age-standardized death from NCD due to tobacco use decreased (29%) from 180 (95% UBI 15-216) in 1990 to 128 (95% UI 108-148) in 2017 in both sexes, with deaths occurring mostly from tobacco smoking. The DALY's and decreased by 31% from 4171 (95% UI 3197-4911) in 1990 to 2880 (95% UI 2423-3338) in 2017 in both sexes, with disability most for smoking. Over the same period, deaths and DALYs from NCDs showed decreasing trends in both sexes due to toback smoking, second-hand smoking, and chewing tobacco, liographique

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 Tuberculosis
 The attributable age-standardized deaths and DALYs from tuberculosis due to tobacco use showed falling for uses related to text and the sexes.

 DISCUSSION
 Prevalence and patterns of tobacco use

 The GBD study results indicate that throughout the time between 1990 and 2015, the prevalence of daily degrate to smoking decreased by 33% in male (24% in 1990 and 36% in 2015), by 48% in female (20% in 1990 and 10% in 2015) and by Total and the general population

 33% in male (24% in 1990 and 36% in 2015), by 48% in female (20% in 1990 and 10% in 2015) and by zwie in the general population (28% in 1990 and 20% in 2015). One reason for the decrease in the prevalence of daily tobacco use could be Nepal's implementation of WHO FCTC in 2006¹² and Tobacco Control and Regulatory Bill in 2011⁵, which regulate the law of gobacco use in Nepal. In reviewing previous literature, it is evident that gender, geographical and socio-economic variation do playar role in observed differences in the pattern of tobacco use. In Nepal, the use of tobacco products is practiced extensively in the elderly population, males, people with lower education levels, rural areas, mountainous areas than in plain areas, and Far- and Mid-western regions than in Eastern, Central, and Western regions.¹⁸ In addition to that, in Nepal, people in mountainous areas tend to smoke more while, beople in plain areas tend to chew tobacco more.^{18,19} Elderly people have different beliefs around tobacco use, like continuing tobace diges no harm, and stopping tobacco does not improve health status.²⁰ People who are less educated might have a lower level of aware so f the harmful hazards of tobacco use. However, in recent times, males of the young age group have high tobacco consumption.⁶ A similar pattern of variation in tobacco use was noticed in the Southeast Asian population. The higher prevalence of smoking in males was o Beserved in Asian countries like Malaysia, the Philippines, Singapore, Vietnam, Indonesia, Maldives, and Bangladesh.^{21,22} In these countres, gender seems to be an important determinant of the initiation of the smoking habit and for perpetuating it. Social norms and the protation of tobacco use can

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 BMJ Open be one of the factors responsible for the lower prevalence of tobacco use in the female population in Southeast Asian countries.²³ Smokeless form of tobacco was common in countries like India, Nepal, Bangladesh, Maldives, and Camboa ia. Fince asing age, poverty, ß and poor education were associated with higher consumption of tobacco in these countries. N

It was evident from the results that, age-standardized rates of death and disability due to smokeless tobac a field in decreasing, however, the absolute number of deaths and disabilities due to smokeless tobacco is increasing. In recent years Bethe Southeast Asia region, including Nepal, there is a clear increase in preference to using smokeless tobacco over tobacco smoking with a higher prevalence of smokeless tobacco in males.^{6–8,24} Smokeless tobacco is associated with a higher risk of getting cancer²⁵ a getardiovascular risk factors like hypertension, metabolic syndrome, and cardiovascular events like acute coronary syndrome²⁶ than no account users, although less than tobacco smoking. The increased prevalence of smokeless tobacco in the Nepalese population and the statistical increase in the risk of cancer associated with it might be the reason for the increase in disability rate from all neoplasms due to be wing tobacco. According to a study in Nepal, most of the consumers of smokeless tobacco are unaware of its harmful health hazards. Studies have shown that smokers tend to perceive smokeless tobacco as less harmful than smoking.²⁸ This belief might exist amaig smokers in Nepal and the extent of such beliefs needs to be explored in detail. The production of smokeless tobacco products is and the increased import of smokeless from the neighboring country, India made the products easily accessible algover the country.²⁷ And, owing to the government's lower taxation imposed on smokeless products compared with smoking tobacce.products, smokeless tobacco products have an added affordability.⁶ Tobacco products such as bidis and smokeless tobacco are perceived as "hard to tax" due to their more informal nature. Thus, all these factors with more emphasis on tobacco control policy on tobacco smaking over smokeless tobacco with lack of awareness towards the hazards of smokeless tobacco products seem to be the cause for shifting the preference of consumers from smoking to smokeless tobacco.

The results indicate that the age-standardized rates of death among males due to cardiovascular diseases, and age-standardized deaths and disability due to diabetes and kidney diseases in both sexes, attributable to second-hand smoking are in the increasing pattern. At the global level, around 40% of children, 33% of male non-smokers, and 35% of female non-smokers are estimated to have been exposed

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 BMJ Open to second-hand smoke regularly, with Southeast Asia and the Western Pacific region accountable for 50% of the globe's total burden from second-hand smoke exposure.²⁹ Most of the deaths attributable to second-hand smoke occurred fism schemic heart disease in adults and lower respiratory tract infections in children, women having the greatest burden among all. Must DALYs lost secondary to second-hand smoke exposure occurred due to lower respiratory tract infections and ischemic heart dise affected ones.²⁹ In Nepal, public transports and restaurants are the major areas of second-hand smoke expositive in public places, while homes and workplaces are indoor areas of second-hand smoke exposure.⁵ Deaths and DALYs attributable to tobacco Tobacco use was the second most common risk factor for deaths and the third most common risk factor

2017.³⁰ In numbers, 14.73% (95% UI 12.52-16.58) of total deaths and 7.8% (95% UI 6.68-9.06) of total BALYs were attributed to tobacco use in 2017.³⁰ In between 1990 and 2017, the total deaths attributable to tobacco use, including any form, in all ages increased by 39% in the general population (both males and females) and DALYs attributable to tobacco use, in all ages increased by 11% males but decreased by 9% in females, with tobacco smoking having the most contribution Also, in 2017 most of the tobacco attributable deaths were due to cardiovascular disease, diabetes, neoplasm, and kidney disease. Between 1990 and 2017 tobacco attributable disease occupied a larger proportion of cause of death in Nepal. In contrary to an overall decrease in the prevalence of tobacco use and age-standardized deaths and DALYs in both males and females in recent decades, the Btal deaths and DALYs were higher in 2017 compared with 1990. One plausible explanation for this pattern could the population growt in Nepal, 29 million in 2019 compared with 18.9 million in 1990.³¹ The rising number of tobacco consumers despite the overall decrease in the prevalence of tobacco use can be attributed to population growth compared with 1990. Furthermore, the elderly population tends do have smoked for more decades considering they started consuming tobacco from an early age. Thus, they tend to have the highest exposure to tobacco which can support a fact that the mortality attributable to tobacco becomes evident usually after the two to three decades of tobacco use.³² This

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BMJ Open BMJ Open evidence also explains the reason why there are increasing deaths and disabilities with an increase in age. Consequently, the deaths attributed to tobacco use may continue to rise in the long run despite the decrease in the prevalence of tobacco use.

Policy related to tobacco in Nepal In response to the global tobacco epidemic, WHO launched a global public health treaty in 2003 named on tobacco control (WHO FCTC).³³ Nepal signed the WHO FCTC in 2003 with the ratification of the treating in 2006.¹² In 2008, to efficiently implement the FCTC, WHO launched the MPOWER policy to lower the tobacco demand in in individual countries,³⁴ which was adopted by Nepal. The Parliament of Nepal passed the Tobacco Control and Regulatory Bill in 2011 勤臣 provisions of WHO FCTC which is currently the primary law that governs tobacco use. This act regulates the use of workplaces and public transport, advertisement, and promotion of any kind of tobacco products, and packaging and labeling of tobacco products. However, the question that arises is how effective the law is, and how effective we have been in protecting people from tobacco use, tobacco-related deaths, and disability. The decreasing trends in the prevalence of tobace of tobace and age-standardized deaths and DALYs attributable to tobacco suggest that tobacco control has been effective so far. Nepal reserved a Bloomberg Philanthropies Award for Global Tobacco Control in 2015 for its work in control and reduction of tobacco product use by warning people about the hazards of tobacco use.³⁵ The tobacco act has emphasized more on packaging and promotion to abate the consumption of tobacco products. In the STEPS survey conducted in 2019, 75.7% of adults noticed healt warnings on tobacco packages and 44.8% of current users thought of quitting because of such warnings. However, the tobaccoactes limited by a lack of knowledge on the implementation of regulations in public places and around the educational hubs. Though the control of tobacco use in Nepal appears well in the last few decades, the progress seems static in recent times. The STEPs survey conducted in Nepal in 2019 showed only a minor drop in the prevalence of former smokers or former smokeless tobacco users in comparison to 2013.⁵ Tobacco control, not only contributes to improving the health of its consumers but also is very important for economic development. On

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BMJ Open BMJ Open average, the average amount of money spent per year on cigarettes is around 11% of GDP per capita.⁵ Nepal surrently imposes a tobacco tax of just 15.5 percent of retail price (excluding VAT) which is the lowest among the South Asian countries and far below the WHO guideline of 70 percent of the retail price.³⁶ Tobacco taxation increases the retail price of tobac to products and reduces the demand therefore is considered to be the most cost-effective method in tobacco control.³⁷ A 10 percent inscrease in the price of tobacco products is expected to reduce the demand by 5-10% in lower and middle-income countries.⁴ Give the high burden of 2021. Downloa gnement Super tobacco use in Nepal, an increment of the tax on tobacco products should be given high priority.

Limitations of study

There are a few limitations to the study. First is the lack of primary data sources from Nepal and those in the study. are limited in scope, coverage, and quality. Nepal also lacks a cause of death surveillance system to document disease-related deaths. However, in resource-limited countries like Nepal, where reliable health statistics are limited, the GHE data provide nationally representative findings, providing evidence-based strategies for policymaking. Second, the prevalence a f smoking could have been underestimated as the GBD data only takes into account the prevalence of daily smoking and lacked the data for the prevalence of smokeless tobacco and second-hand exposure. This could have resulted in an underestimation of attributable disease burden especially in populations who tend to use less tobacco every day. Also, the data did not account for the duration and interstity of tobacco use. Third, the burden estimates are limited by not considering indoor and outdoor air pollution. Nepal has experience a massive increase in air technologies une 12, 2025 at Ag pollution during the time in most of the cities, which could confound the findings.

CONCLUSIONS

This study is one of the first studies in Nepal to show the trend of mortality and DALY attributable to tobacco use. There is a decreasing trend in the prevalence of smoking, age-standardized mortality, and DALYs between 1990 and 2017. Howe Er, there was a more than one-third increase in crude mortality rate. NCDs contributed the most deaths and disabilities attributable to to to there is a huge

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BMJ Open increase in deaths and DALY due to chewing tobacco from 1990 to 2017. Awareness along with the strong increase in deaths and DALY due to chewing tobacco from 1990 to 2017. control strategies on all forms of tobacco including second-hand exposure and increasing taxation can fur her help to decrease the trend in the future. There is also a need for a robust and reliable data representative of all regions in Nepal to understand the effect of tobacco August 2021. Downloaded from Enseignement Superieur (ABI control policies.

Conflict of interest

 The authors declared that they have no conflict of interest.

Contributorship statement

≥ Gambhir Shrestha: Conceptualization, Methodology, Software, Formal analysis, Supervision, Writing-Oraginal draft preparation.

Prabin Phuyal: Software, Formal analysis, Visualization, Writing-Original draft preparation. on June 12, 2025 at Agence

Rashmi Mulmi: Conceptualization, Visualization, Writing-Reviewing, and Editing.

Pranil Man Singh Pradhan: Methodology, Visualization, Writing-Reviewing, and Editing.

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| 1 2 3 4 | BMJ Open 36/bm jopen-2020-047847 on Data sharing statement a | |
| 5 6 | Data sharing statement | |
| 7 8 9 | All data relevant to the study are included in the article and can be assessed through the website http://ghdx.healthdata.org/ | |
| 10 11 | Ethics approval statement | |
| 12 13 14 | This is a database study that used the freely available data from GBD study and does not require ethics appropriate $\vec{a} \neq \vec{a}$ | |
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 Nepal Health Research Council, Ministry of Health and Population, Monitoring Evaluation and Operational Research. Nepal

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| For peer review only - http://bmjopen.bmj.com/site/about/guideli | Agence Bibliographique de I |
| | Asamblea Mundial de la Salud 56. WHO framework convention on tobacco control. 496. doi:10.1590/S1135-57272003000400005 WHO EMRO MPOWER TFI. 2015 Bloomberg Philanthropies Awards for Global Tobacco Control: Meet the Winn Philanthropies. World Health Organization. WHO report on the global tobacco epidemic 2019: Offer Switzerland: World Health Organization; 2019. 2020. https://www.who.int/teams/heareport-on-the-global-tobacco-epidemic-2019. World Health Organization. <i>WHO Technical Manual on Tobacco Tax Administration</i> https://www.who.int/tobacco/publications/tax_administration/en/. |

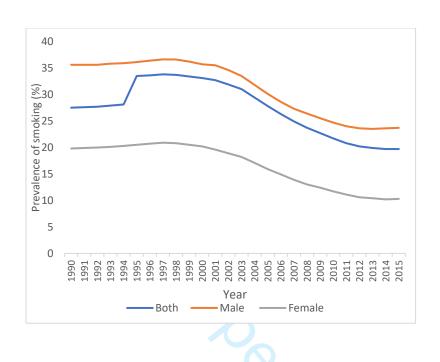
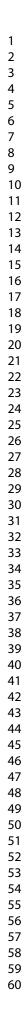


Figure 1: Prevalence of smoking from the year 1990 to 2015 in Nepal



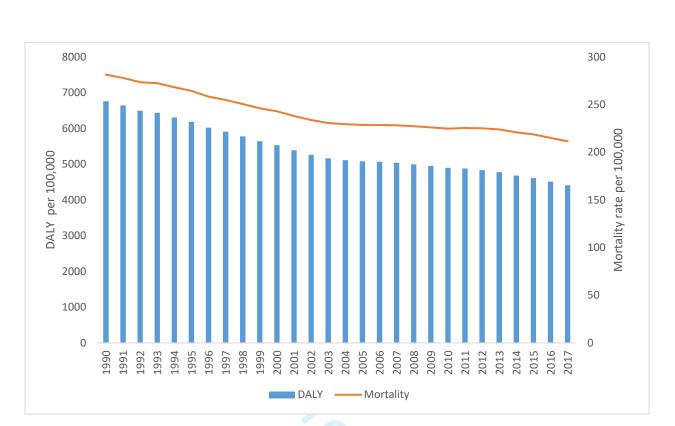
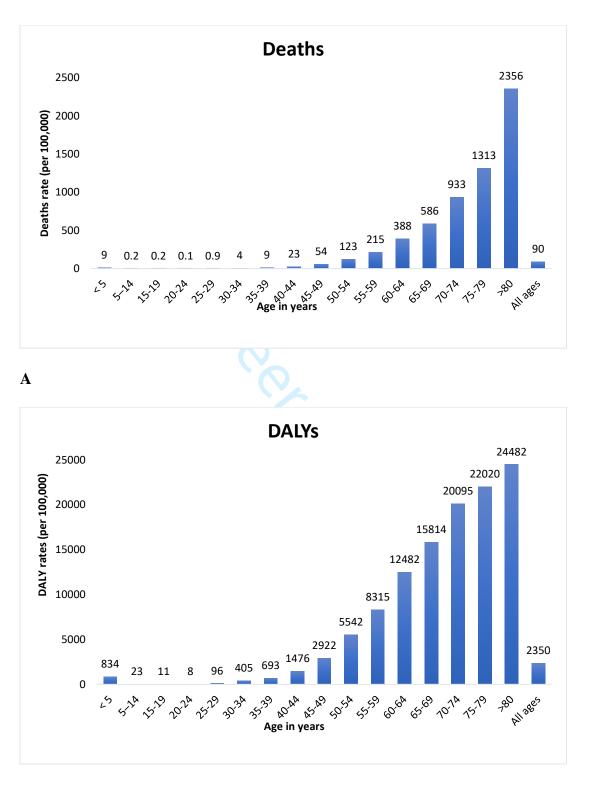


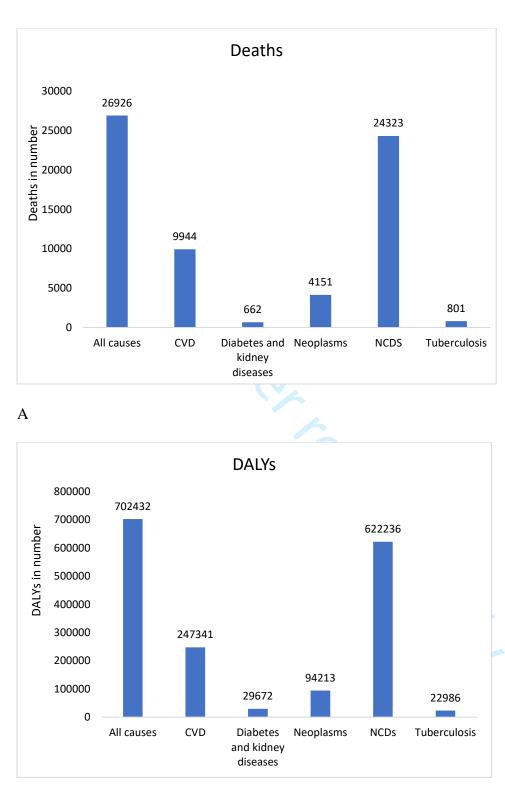
Figure 2: Trend of age-standardized mortality rate and DALYs attributable to tobacco from 1990-2017 in Nepal

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B

Figure 3: Age-wise deaths (A) and DALYs (B) rates in all causes in both sexes attributable to tobacco, including all types, in 2017



B

Figure 4: All-age deaths (A) and DALYs (B) from different diseases attributable to tobacco use (including all types) in Nepal in 2017

| | All-Age Deat | hs, No. in Thousands (95% UI) | All-Age DALYs, No. in Housends (95% UI) | | | | |
|---------------|------------------------------|-------------------------------|---|--|--------------------------------|--|-------------|
| Subcategory | 1990 | 2017 | change, % | 1990 | , on 23 ding fo | 2017 | Change % |
| All causes | | | | | for X | | , , |
| Tobacco | | | | | ĽШĹ | | |
| Male | 11763.49 (9612.18-14237.80) | 17372.20 (14056.39-20307.12) | 47.68 | 403665.07 (319794.17-512869.65) | 446131 68 3364 | 621.77-524648.21) 568.71-316572.58) | 10.52 |
| Female | 7608.83 (5827.14-9679.57) | 9553.55 (7463.66-12031.65) | 25.56 | 280977.20 (205487.39-373383.63) | 256300 3362 | 568.71-316572.58) | -8.78 |
| Both | 19372.32 (16059.91-23310.44) | 26925.75 (22826.17-31135.35) | 38.99 | 684642.27 (538331.13-875950.09) | 702432 9.19 5 | 8052.53-812425.42) | 2.60 |
| Smoking | | | | | ate D2 | 3052.53-812425.42) | |
| Male | 9858.89 (8016.19-12138.96) | 15573.83 (12511.70-18320.09) | 57.97 | 280385.51 (227328.27-345198.66) | 387323 0 3 3 314 | 734.78-458240.78) | 38.14 |
| Female | 5619.71 (4163.78-7373.09) | 7984.05 (6026.50-10280.06) | 42.07 | 153618.50 (116802.49-200154.70) | 201074 | 5098.74-253269.80) | 30.89 |
| Both | 15478.60 (12838.83-18675.51) | 23557.88 (19798.77-27400.07) | 52.20 | 434004.01 (360694.99-523145.50) | 588397 3.45 | 193.19-690655.02) | 35.57 |
| Chewing | | | | | 것 드 크 | | |
| obacco | 324.53 (221.95-453.10) | 595.13 (412.87-782.12) | 83.38 | 9802.97 (6587.60-13907.45) | 15546.94 608 | 31.34-20552.20) | 58.59 |
| Male | 142.83 (98.54-201.01) | 268.19 (194.01-356.27) | 87.76 | 3558.17 (2385.54-5110.57) | 6011.172473 | 98-8176.42) | 68.94 |
| Female | 467.36 (351.24-609.37) | 863.32 (664.09-1073.70) | 84.72 | 13361.13 (9934.89-17759.87) | 21558.10 00 |)5.69-27194.58) | 61.35 |
| Both | | | | | ata | | |
| Secondhand | | | | | a mi | | |
| smoking | | | | | | | |
| Male | 2023.02 (1223.08-3116.32) | 1966.04 (1388.69-2649.68) | -2.82 | 125282.54 (64552.81-208075.08) | 61759. | 9.97-84284.35) | -50.70 |
| Female | 2133.57 (1257.73-3283.64) | 1717.76 (1179.09-2388.87) | -19.49 | 130921.51 (68925.95-212905.05) | | 21.33-80159.30) | -55.13 |
| Both | 4156.59 (2503.94-6381.37) | 3683.80 (2641.33-4882.95) | -11.37 | 256204.06 (133797.03-415607.64) | 120507 43 (8 | 16.83-162640.49) | -52.96 |
| Cardiovascula | r diseases | | | | trai | 1 | |
| Говассо | | | | | nir <mark>9</mark> | | |
| Male | 3791.45 (2966.34-4752.99) | 7184.91 (5484.11-8728.33) | 89.50 | 106045.53 (82267.08-133672.18) | | 5047.16-220860.34) | 68.59 |
| Female | 1939.91 (1409.64-2638.17) | 2759.22 (2031.88-3598.37) | 42.23 | 51596.75 (37925.85-69499.33) | 68559.0 <mark>0</mark> (51 | 6.16-88568.29) | 32.87 |
| Both | 5731.36 (4645.29-7010.77) | 9944.13 (7888.43-12157.90) | 73.50 | 157642.28 (126776.05-193554.33) | 247340 22 (1) | 740.00-303138.58) | 56.90 |
| Smoking | | | | | s s | | |
| Male | 3453.41 (2688.03-4375.06) | 6398.37 (4808.50-7886.57) | 85.28 | 96619.66 (74256.9 <mark>0-</mark> 122738.75) | | 0281.99-198937.41) | 64.85 |
| Female | 1631.37 (1150.06-2269.44) | 2305.75 (1631.12-3096.08) | 41.34 | 42772.31 (30386.44-59660.41) | 56949.0 (41 9) | 94.34-75687.19) | 33.14 |
| Both | 5084.78 (4033.28-6349.49) | 8704.12 (6785.50-10755.96) | 71.18 | 139391.98 (110502.77-173724.72) | 216225,93 (167 | 097.28-267200.96) | 55.12 |
| Secondhand | | | | | te un | | |
| smoking | | | | | ch e | | |
| Male | 470.29 (335.36-642.16) | 1019.62 (716.19-1367.19) | 116.81 | 13262.84 (9357.97-18103.45) | | 29.80-34584.44) | 94.14 |
| Female | 392.38 (279.69-543.01) | 552.72 (399.72-738.60) | 40.86 | 11177.24 (7815.41-15454.67) | | 2.59-19091.91) | 27.57 |
| Both | 862.67 (645.37-1136.15) | 1572.35 (1155.62-2052.89) | 82.27 | 24440.09 (18131.54-32553.33) | 40007.49.(28 | 1.94-52101.01) | 63.70 |
| | sidney diseases | | | | s. at | | |
| Fobacco | 00.05 (45.50.102.07) | | 250 51 | | A 9 | | 150.10 |
| Male | 89.86 (46.50-132.87) | 341.19 (212.30-499.97) | 279.71 | 6537.41 (4043.63-9355.31) | | 53.78-22939.55) | 150.43 |
| Female | 83.46 (40.03-146.03) | 320.67 (180.70-493.02) | 284.24 | 5137.20 (2824.43-7939.95) | 13300.29 (74 | | 158.90 |
| Both | 173.31 (104.61-250.63) | 661.86 (423.10-933.46) | 281.89 | 11674.62 (7240.42-16558.61) | 29671.92 (1894 | 7.14-41567.02) | 154.16 |
| Smoking | | | | | Sector Sector | | 100 -0 |
| Male | 60.05 (31.00-92.21) | 215.64 (125.04-325.16) | 259.10 | 4392.28 (2637.49-6322.29) | 10215.58 (63 |).69-14596.02) | 132.58 |
| Female | 38.47 (16.74-70.51) | 135.17 (71.15-222.16) | 251.37 | 2188.41 (1197.36-3496.51) | 5142.53 (290 | | 134.99 |
| Both | 98.52 (56.73-144.71) | 350.81 (205.70-514.87) | 256.08 | 6580.70 (4055.51-9682.42) | 15358.11 (94 2 6 | 5.86-22203.75) | 133.38 |
| | | | | | hique | | |
| | | | | | nl ie de | | |

BMJ Open BMJ Open Supplementary Table 1. All-age deaths and DALYs for different diseases attributable to tobacco and their percentage in Nepal, 1990-2017

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| Secondha smoking | nd | | | | , ir 041 | |
| Male | 35.40 (12.48-60.40) | 143.98 (52.67-241.44) | 306.69 | 2525.21 (955.13-4178.18) | 7028.3 | |
| Female | 49.68 (16.07-97.51) | 199.24 (74.84-338.96) | 301.03 | 3218.62 (1162.47-5459.71) | 8689 48 331 27-13987 41) | |
| Both | 85.08 (30.02-145.39) | 343.22 (128.33-559.19) | 303.39 | 5743.83 (2138.89-9608.90) | 15717.8 (59 6.86-24952.45) | |
| All Neopl | asms | | | | for L | |
| Tobacco | | | | | us muc | |
| Male | 1458.30 (1139.03-1890.08) | 2795.38 (2190.73-3628.29) | 91.69 | 38763.61 (30206.76-49414.72) | 63597.5% (325) 30615.3% (325) 30615.3% (325) 30615.3% (325) | |
| Female Both | 850.81 (606.63-1144.57) 2309.11 (1829.24-2855.31) | 1355.16 (979.14-1773.62) | 59.28 79.75 | 22919.15 (16055.39-31167.33) 61682.77 (48392.88-76293.78) | 30615.3 3 @248 7.11-40608.53) 94212.8 3 9 4 2 7.14-114859.20) | |
| Smoking | 2307.11 (1027.24-2033.31) | +150.54 (5550.01-5024.05) | 17.15 | 01002.77 (403)2.00-702)3.70) | | |
| Male | 1250.10 (975.25-1649.62) | 2401.44 (1848.26-3151.69) | 92.10 | 32126.79 (24809.85-42129.01) | 52760.14 (2015) | |
| Female | 720.15 (488.16-1000.56) | 1097.67 (750.55-1488.11) | 52.42 | 19297.97 (12618.21-27388.48) | 24084.56 46 09.46-32930.07) | |
| Both | 1970.25 (1545.76-2475.89) | 3499.11 (2734.84-4290.12) | 77.60 | 51424.76 (40202.22-65087.14) | 76844.66 59 507.14-94791.62) | 4 |
| Chewing tobacco | 324.53 (221.95-453.10) | 595.13 (412.87-782.12) | 83.38 | 9802.97 (6587.60-13907.45) | 15546.94 (6 0 6 81.34-20552.20) | |
| Male | 142.83 (98.54-201.01) | 268.19 (194.01-356.27) | 87.76 | 3558.17 (2385.54-5110.57) | 6011.172433898-8176.42) | (|
| Female | 467.36 (351.24-609.37) | 863.32 (664.09-1073.70) | 84.72 | 13361.13 (9934.89-17759.87) | 21558.10 (600)5.69-27194.58) | |
| Both | .4 | | | | iror (A | |
| Secondha smoking | IU | | | | mi BE - | |
| Male | 21.07 (8.88-41.47) | 41.08 (18.62-77.70) | 95.01 | 551.75 (228.76-1067.50) | 939.60 | |
| Female | 34.30 (13.82-61.95) | 71.29 (29.95-123.53) | 107.84 | 1071.97 (442.54-1953.02) | 2081.0 | 9 |
| Both | 55.37 (28.26-90.91) | 112.37 (57.13-183.26) | 102.96 | 1623.73 (810.67-2684.85) | 3020.6 | 5 |
| Non-com | nunicable diseases | | | | trai | |
| Tobacco | | | = 1 10 | | | |
| Male Female | 9084.74 (7213.20-11113.09) 5405.68 (4000.45-7169.95) | 15843.57 (12712.23-18568.33) 8479.47 (6562.76-10786.52) | 74.40 56.86 | 258037.36 (208400.97-311823.54) 149766.37 (113912.16-195422.04) | 399996 2 4 (325615.15-473155.30) 222238 3 8 (1 2 6225.32-276201.22) | |
| Both | 14490.42 (12108.44-17315.76) | 24323.04 (20523.48-28032.74) | 67.86 | 407803.74 (341565.27-482686.51) | 622235 7 2 (521551.91-724024.44) | |
| Smoking | × , , , , , , , , , , , , , , , , , , , | · · · · · · · · · · · · · · · · · · · | | | s s | |
| Male | 8360.61 (6594.62-10279.50) | 14278.19 (11397.99-16901.41) | 70.78 | 235498.35 (188051.06-288093.77) | 356411 3 3 (288822.06-421623.66) | |
| Female | 4650.42 (3337.03-6281.82) | 7178.97 (5429.79-9244.20) | 54.37 | 125863.59 (93741.89-167530.95) | 18325258 (191279.02-232004.89) | |
| Both Chewing | 13011.04 (10706.22-15734.95) | 21457.17 (17836.70-25205.32) | 64.92 | 361361.93 (297489.31-433996.59) | 539664 #2 (445211.65-635293.86) | 4 |
| tobacco | 324.53 (221.95-453.10) | 595.13 (412.87-782.12) | 83.38 | 9802.97 (6587.60-13907.45) | 15546.9 (10081.34-20552.20) | |
| Male | 142.83 (98.54-201.01) | 268.19 (194.01-356.27) | 87.76 | 3558.17 (2385.54-5110.57) | 6011.17784237398-8176.42) | |
| Female | 467.36 (351.24-609.37) | 863.32 (664.09-1073.70) | 84.72 | 13361.13 (9934.89-17759.87) | 21558.15 (16005.69-27194.58) | |
| Both Secondha | nd | | | | 025 ; gies. | |
| smoking | | | | | s. at | |
| Male | 826.51 (544.18-1157.79) | 1707.58 (1204.09-2298.64) | 106.60 | 24185.68 (16369.38-33055.50) | 46057.83 (32)3.64-60548.19) | |
| Female | 885.80 (562.91-1315.63) | 1428.84 (955.94-2015.36) | 61.31 | 27170.66 (17935.98-39583.53) | 42147.61 (28 47.28-57043.88) | - |
| Both | 1712.31 (1160.43-2406.58) | 3136.42 (2218.91-4183.96) | 83.17 | 51356.35 (35980.77-71788.94) | 88205.44 (62 2 08.63-115112.33) | 7 |
| Tubercul | osis | | | | Bib | |
| Tobacco Male | 1065.82 (611.69-1723.30) | 533.34 (298.43-827.30) | -49.96 | 34317.44 (19894.39-54836.53) | 15474.57 (8686.80-23623.93) | |
| Female | 667.34 (210.36-1288.01) | 267.93 (114.47-461.56) | -49.96 -59.85 | 21064.12 (7035.82-39071.66) | 7511.65 (342 3 62-12761.83) | |
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| Both Smoking Male Female Both | 1733.16 (962.41-2696.31) 1065.82 (611.69-1723.30) 667.34 (210.36-1288.01) 1733.16 (962.41-2696.31) | 801.27 (445.52-1198.40) 533.34 (298.43-827.30) 267.93 (114.47-461.56) 801.27 (445.52-1198.40) | -53.77 -49.96 -59.85 -53.77 | 55381.56 (31368.85-84009.28) 34317.44 (19894.39-54836.53) 21064.12 (7035.82-39071.66) 55381.56 (31368.85-84009.28) | 22986.22 (1204.67-33890.22) 15474.04 (868.80-23623.93) 7511.6203425 (62-12761.83) 22986.20 (1214.67-33890.22) | -58.49 -54.91 -64.34 -58.49 |
| Male | 667 24 (210 26 1299 01) | 267 02 (114 47 461 56) | 50.85 | | 15474. | 61.21 |
| | | | | | 23 August 2021. Downloaded from http://bmjopen.bmj.com/ on June 12, 2025 a Enseignement Superieur (ABES). for uses related to text and data mining, Al training, and similar technologies. | |
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The burden of tobacco in Nepal: a systematic analysis from the Global Burden of Disease Study 1990-2017

STROBE Statement-Checklist of items that should be included in reports of cross-sectional studies

| | Item No | Recommendation | Please insert check where included or N/A where no applicable |
|------------------------------|------------|--|---|
| Title and abstract | 1 | (<i>a</i>) Indicate the study's design with a commonly used term in the title or the abstract | Pg 1-2 |
| | | (b) Provide in the abstract an informative and balanced summary of what was done and what was found | Pg 2 |
| Introduction | | | |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported | Pg 3-4 |
| Objectives | 3 | State specific objectives, including any prespecified hypotheses | Pg 4 |
| Methods | | | |
| Study design | 4 | Present key elements of study design early in the paper | Pg 5 |
| Setting | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | Pg 5 |
| Participants | 6 | (<i>a</i>) Give the eligibility criteria, and the sources and methods of selection of participants | NA |
| Variables | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | Pg 6 |
| Data sources/ measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | Pg 5-6 |
| Bias | 9 | Describe any efforts to address potential sources of bias | Pg 17 |
| Study size | 10 | Explain how the study size was arrived at | N/A |
| Quantitative variables | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why | Pg 6 |
| Statistical methods | 12 | (<i>a</i>) Describe all statistical methods, including those used to control for confounding | Pg 6 |
| | | (b) Describe any methods used to examine subgroups and interactions | Pg 5-6 |
| | | (c) Explain how missing data were addressed | N/A |
| | | (<i>d</i>) If applicable, describe analytical methods taking account of sampling strategy | N/A |
| | | (<i><u>e</u></i>) Describe any sensitivity analyses | N/A |
| Results | | | |
| Participants | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included | N/A |
| | | in the study, completing follow-up, and analysed | |
| | | (b) Give reasons for non-participation at each stage | NA |
| | | (c) Consider use of a flow diagram | - N/A |

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| | | social) and information on exposures and potential confounders | |
|-------------------|-----|---|---------|
| | | (b) Indicate number of participants with missing data for each variable of interest | N/A |
| Outcome data | 15* | Report numbers of outcome events or summary measures | N/A |
| Main results | 16 | (<i>a</i>) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | Pg 7-12 |
| | | (<i>b</i>) Report category boundaries when continuous variables were categorized | Pg 7-12 |
| | | (<i>c</i>) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period | N/A |
| Other analyses | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses | Pg 7-12 |
| Discussion | | | |
| Key results | 18 | Summarise key results with reference to study objectives | Pg 13-1 |
| Limitations | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias | Pg 17 |
| Interpretation | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | Pg 17 |
| Generalisability | 21 | Discuss the generalisability (external validity) of the study results | Pg 17 |
| Other information | | | |
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | Pg 18 |
| | | | |