Brief report

National Institutes of Health Funding for Tobacco Versus Harm From Tobacco

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Abstract

Introduction: Previously, the author documented that, even though tobacco-related diseases accounted for 20% of US deaths, in 1995 the National Institutes of Health (NIH) expended only 1.1% of its budget on tobacco research. The current analysis is a replication test of this result and adds other outcomes and comparisons.

Methods: The author obtained NIH funding information for tobacco, alcohol, and drug use and for obesity for each year between 2007 and 2014 from *Project Reporter* and compared these to the total NIH budget and to measures of disease burden.

Results: NIH allocated \$321 million for tobacco research in 2014. The percent of the NIH budget dedicated to tobacco was 1.3% in 2014 and has not changed since 1995; similar rates for alcohol, drug, and obesity problems in 2014 were 1.8%, 3.3%, and 3.8%. The ratio of spending to mortality from a risk factor was substantially less for tobacco compared to alcohol or obesity problems (0.07 vs. 0.60 and 0.30).

Conclusion: These results replicate our earlier findings. Tobacco research continues to be underfunded at the NIH compared to its disease burden in the United States and to NIH funding for other behavioral risk factors.

Introduction

Several studies have reported that tobacco use is one of the biggest risk factors for disease burden, whether this is measured by mortality, years of life lost, years lived with disability or their product—disability-adjusted life-years. For example, tobacco is responsible for 18%–23% of deaths in the United States.^{1,2} Two analyses of the Global Disease Burden Study found tobacco was the third or fourth leading cause of death worldwide.^{3,4}

Recently, scientists and advocates have questioned whether health research institutions allocate their research funding proportionate to the disease burden of different diseases or risk factors.⁵ Empirical studies of Australian,⁶ Canadian,⁷ Chinese,⁸ and United States^{9,10} health research institutes have found funding for specific diseases is modestly correlated with disease burden outcomes; however, each of these studies found several instances of large discrepancies

between funding and disease burden. Unfortunately, none of these six studies examined tobacco use; however, the current author previously documented the underfunding of tobacco research in two articles.^{11,12} One of these noted that even though smoking accounted for about 20% of deaths in the United States, it received only 1.1% of National Institutes of Health (NIH) research funding.¹² That finding was based on funding 20–40 years ago; thus, the current study examines more recent data to assess the percent of NIH funds allocated to tobacco research

Methods

The author obtained data from the *Project Reporter* page “Estimates of Funding for Various Research, Condition, and Disease Categories (RCDC)” that lists NIH research funding by disease or risk factor

(http://report.nih.gov/categorical_spending.aspx). The website states “this new process, implemented in 2008 through the Research, Condition, and Disease Categorization system, uses sophisticated text data mining (categorizing and clustering using words and multiword phrases) in conjunction with NIH-wide definitions used to match projects to categories. Research, Condition, and Disease Categorization use of data mining, improves consistency and eliminates the wide variability in defining the research categories reported. The definitions are a list of terms and concepts selected by NIH scientific experts to define a research category. The research category levels represent the NIH’s best estimates based on the category definitions. The NIH does not expressly budget by category. The annual estimates reflect amounts that change as a result of science, actual research projects funded, and the NIH budget. The research categories are not mutually exclusive. Individual research projects can be included in multiple categories so amounts depicted within each column of this table do not add up to 100 percent of NIH-funded research.” The process for defining categories including what terms are included (eg, tobacco research could include research on nicotine delivery devices) and how they are “validated” by expert scientists is described at <http://report.nih.gov/rcdc/process.aspx>; however, the specific process for the term tobacco research is not cited. In comparison, our earlier study,¹² results were based on a different NIH database that no longer exists (Computer Retrieval of Information on Scientific Projects). In this database, tobacco/nicotine grants were identified from the principal investigator’s (ie, not from NIH personnel’s) list of up to 10 “primary keywords” taken from a thesaurus of terms from NIH.

Data on mortality was obtained from the Centers for Disease Control and Prevention¹ and data on morbidity was obtained from the “high income North America” results for the WHO Global Burden of Disease Study.³

Results

In 2014, NIH expended \$321 million dollars on tobacco research (not including administrative costs). Funding for tobacco, alcohol, and drug

research has remained constant from 2007 to 2014 but funding for obesity research appears to have increased over this time period (Figure 1). The funding for the total research budget for NIH has remained fairly steady over the same period (www.nih.gov/about/budget.htm); thus, the percent of NIH funding for tobacco research has remained steady over time. In the most recent report, in 2013, NIH allocated 1.3% of research funds to tobacco, 1.8% to alcohol, 3.3% to obesity and 3.8% to drug problems. The ratio of percent of NIH funding/percent of deaths from each risk factor using 2009 US mortality data² is 0.07 for tobacco, 0.60 for alcohol and 0.30 for obesity. No data for drug use mortality was available in this dataset; however, drug use results in a very small number of deaths compared to these other three factors² thus, the ratio for drug abuse should be much greater than for alcohol or obesity. The ratio of percent funding to disability-adjusted life-years in “high income North America”³ is 0.40 for tobacco, 0.80 for alcohol, 0.60 for drug abuse and 0.12 for obesity.

Discussion

Although funding for tobacco research might be considered large in absolute terms (\$321 million), the percent of NIH funding devoted to tobacco research is small and has not substantially changed over the last 18 years (1.1% in 1995 vs. 1.3% in 2013). The ratio of funding to mortality appears lower for tobacco than for alcohol, drug, or obesity outcomes. In interpreting these percentages, readers should note that much of NIH research is not disease specific; for example, genetics, cellular or epidemiological research. However, even if we deleted all nondisease focused research at NIH from our denominator, it is unlikely this would increase the proportion for tobacco research from 1.3% to near 20%. Also, it would not affect the fact that NIH spends 1.4–2.9 times more research funding on alcohol, drugs, and obesity than on tobacco, despite the fact that tobacco produces much more mortality.

The biggest limitation of the current analysis is that the author could not locate more detail on the methodology used by the NIH for assigning funding to risk factor to evaluate its validity. The author

Figure 1. Hundreds of thousands of dollars spent in each fiscal year of National Institutes of Health (NIH) on tobacco-related extramural research including all funding mechanisms.

Figure 2. Percent of National Institutes of Health (NIH) extramural R01 research applications funded in each fiscal year by institute for all applications; that is, not just for tobacco-related applications.

could not locate an explicit definition of “tobacco research” on a NIH website, nor from communications with NIH. The author’s prior analysis was based on keywords designated by study principal investigators as the primary theme of the research grant, whereas it is unclear who and how the current allocations were made. For example, if a grant studied whether stopping smoking among those with alcohol dependence improved or impaired the ability to stop alcohol use, would that be coded as tobacco-related, alcohol-related or both? As another example, would basic research on dopamine receptors be classified as related to tobacco, alcohol or obesity research? Also, the allocation for drug use simply used the amount funded to the National Institute on Drug Abuse; thus, this amount did not include drug abuse-related research in other institutes, plus NIDA allocates a significant amount of funding for smoking research.

One possible reason for less funding of tobacco may be that grant applications for tobacco research are scored lower in scientific review; however, the author knows of no data to specifically test this hypothesis. The success rates for the two major funders of tobacco research (National Cancer Institute and National Institute on Drug Abuse) do not appear to have declined more than that for NIH as a whole (Figure 2). Another possibility is that tobacco research has produced less-helpful results; however, many have argued just the opposite; that is, that tobacco policy research is an especially good example of research informing policy.¹³ Another possibility is that even though tobacco causes large amounts of mortality it is a less-prevalent disorder or a disorder with less disability-adjusted life years. However, this hypothesis is not supported by the data documenting that there are 42 million smokers (www.cdc.gov/tobacco/data_statistics), 88 million obese persons (www.cdc.gov/obesity/data/adult.html) and 17 million persons with alcohol problems (www.niaaa.nih.gov/alcohol-health) in the United States. Also, in the Global Survey of Disease Burden,³ tobacco was associated with 6.3%, alcohol with 5.5%, and obesity with 3.8% of total disability-adjusted life-years. Another possibility is that much of tobacco research is funded by industry or foundations. In summary, the author knows of no data on this possibility but doubts that such sources spend anywhere near the \$321 million/y allocated by NIH.

In summary, the methods used to calculate the amount of funding on tobacco research are unclear and, thus, the estimate of the amount of funding for tobacco research may not be completely accurate. Nevertheless, this analysis clearly indicates tobacco research is underfunded both in relation to its disease burden and in comparison to other behavioral disorders. Given that tobacco research has significantly contributed to tobacco control efforts and to treatments for smoking cessation, increasing funding to a level more commensurate with tobacco’s importance is likely to provide direct and immediate benefits to public health.

Funding

The author’s time was funded by grant P 50 DA 036114 from the US National Institute on Drug Abuse.

Declaration of Interests

The author has received consulting and speaking fees from several companies that develop or market pharmacological and behavioral treatments for smoking cessation or harm reduction and from several nonprofit organizations that promote tobacco control.

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