ORIGINAL ARTICLE

Comparing cutaneous research funded by the US National Institutes of Health (NIH) with the US skin disease burden

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Background: Disease burden should be an important component for guiding research funding.

Objective: We sought to examine the relationship between dermatologic research funded from 2012 to 2013 by the National Institutes of Health (NIH) and US skin disease burden as measured by disability-adjusted life years in the Global Burden of Disease 2010 study.

Methods: A cross-sectional analysis was independently performed by 2 researchers who matched projects from the 2012 to 2013 NIH Research Portfolio Online Reporting Tools with 15 skin conditions and their respective disability-adjusted life years from Global Burden of Disease 2010.

Results: The NIH funded 1108 projects spanning the 15 skin conditions. Melanoma received almost half of the total skin condition budget (49.5%). Melanoma, nonmelanoma skin cancer, and leprosy were funded above what would be suggested by their disease burden, whereas dermatitis, acne vulgaris, pruritus, urticaria, decubitus ulcer, fungal skin diseases, alopecia areata, cellulitis, and scabies appeared underfunded. Bacterial skin diseases, viral skin diseases, and psoriasis were well matched with disease burden.

Limitations: Disease burden is one of many factors that may be used to guide priority-setting decisions.

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Conclusion: Skin disease burden measured by disability-adjusted life year metrics partially correlates with NIH funding prioritization. Comparing US disease burden with NIH funding suggests possible underfunded and overfunded skin diseases. (J Am Acad Dermatol http://dx.doi.org/10.1016/j.jaad.2015.04.039.)

Key words: dermatitis; disability-adjusted life years; disease burden; leprosy; melanoma; National Institutes of Health; priority setting; skin conditions.

CAPSULE SUMMARY

- Research funding is limited.
- National Institutes of Health funding dollars for dermatologic conditions partially correlate with respective skin disease burdens.
- Increased transparency and accountability of priority-setting processes for large national research organizations will better allocate limited research dollars.

The 2010 Global Burden of Disease (GBD) study quantified disease morbidity and mortality along with 1190 clinical sequelae and 67 risk factors for 291 diseases in 187 countries from 1990 to 2010. The study measured disease burden in disability-adjusted life years (DALYs), which combines years of life lost and years lived with disability such that 1 DALY equates to 1 lost year of healthy life.[1-4] GBD facilitates epidemiologic comparison of disease burden.[5,6] Fifteen skin conditions are represented in the study along with a category for "other skin and subcutaneous diseases."

Before GBD 2010, in 1998, the Institute of Medicine (IOM) urged the National Institutes of Health (NIH) to correlate burden of disease with US funding distribution.[7] Since this proposal, high-mortality diseases, such as HIV, have received far more money per death as compared with other diseases. Lobbying support also influenced research allocation, with every $1000 spent on lobbying translating into $25,000 more in research funding.[8] Despite these changes, the IOM recommendations were not extensively implemented, as prior investigations have revealed that DALYs account for only 33% of NIH disease-specific funding in 2006.[9-11]

As researchers pressure the NIH into representative funding allocation, scientists compete for limited resources.[6] When adjusted for inflation, the 2013 NIH budget represents a 23% decrease compared with the prerecession years in 2003.[11] Applications for research grants and training duration have also declined over the past several years, paralleling the state of NIH funding.[12] Tight allocation of resources ultimately has serious implications for the future direction of research.

The NIH Research Portfolio Online Reporting Tools Expenditures and Results system is a public World Wide Web–based tool with a repository of NIH-funded research. The online portfolio provides access to US-based research abstracts and award amounts.[13] Applicants submit applications for NIH funding, which must be approved by a scientific review group and subsequently approved by Institute and Center (IC) national advisory councils or boards composed of both scientific and public representative experts.[14] In 2012 and 2013, a total of 51,836 and 61,627 research grants were supported by the NIH with an average of $492,012 and $469,562 per grant, respectively.[15] This study compares 2012 to 2013 NIH funding of skin-specific research with respective US disease burden from GBD 2010 to explore the distribution of funding across dermatologic conditions.

METHODS

A cross-sectional analysis was performed comparing the DALYs of 15 GBD 2010 skin conditions with corresponding total NIH grant funds awarded between 2012 and 2013. GBD 2010 collaborators selected 15 skin conditions based on prevalence, common case definitions, and data availability: dermatitis, acne vulgaris, bacterial skin diseases (excluding leprosy), viral skin diseases, urticaria, fungal skin diseases, pruritus, scabies, alopecia areata, cellulitis, decubitus ulcer, melanoma, psoriasis, nonmelanoma skin cancer (NMSC) (composed of squamous and basal cell carcinoma), and leprosy. GBD 2010 also included a category for "other skin and subcutaneous diseases" (Table I). Of note, the dermatitis category includes the following conditions: atopic dermatitis, seborrheic dermatitis, diaper dermatitis, allergic contact dermatitis, irritant contact dermatitis, unspecified contact dermatitis, exfoliative dermatitis, and dermatitis caused by substances taken internally. Global disease burden is broken down into country-specific disease burden. Comparisons with US NIH funding in this article solely use US-specific GBD data. The methods used by the GBD project to generate disability estimates and GBD 2010 *International Classification of Diseases, Ninth Revision* and