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 2015;73:383-91.)

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

Abbreviations used:

DALY: disability-adjusted life year
GBD: Global Burden of Disease
IC: Institute and Center
IOM: Institute of Medicine
NIH: National Institutes of Health
NMSC: nonmelanoma skin cancer

International Statistical Classification of Diseases, 10th Revision code disease definitions are published elsewhere.[16-18] DALY metrics, expressed as percent of total US DALYs of 291 conditions measured in GBD 2010, were obtained from the GBD Compare World Wide Web site.[19] Using this tool, search parameters of "time plot," "DALYs metric," "United States" place, "all ages," "both" sexes, and "%" units were selected.

NIH grants awarded in the United States in 2012 and 2013 were obtained online using NIH Research Portfolio Online Reporting Tools at http://projectreporter.nih.gov/. Within each query page, the Fiscal Year "2012" and "2013" were selected, "Projects" was selected under "Search In," "Text Search (Logic)" was changed to "Advanced," and *International Statistical Classification of Diseases, 10th Revision*–determined search terms were strung with "OR" or "NOT" or "AND" as necessary.

Grant titles and abstracts were evaluated to determine a specified skin condition focus. Terms mentioned solely in "project terms," "application," or "public health relevance" were not used to guide categorization. As per GBD 2010 parameters, grants that focused on internal manifestations of systemic illnesses such as systemic lupus erythematosus and dermatomyositis were excluded. These conditions are included under the GBD 2010 category of "musculoskeletal diseases." However, variants of cutaneous lupus–such as discoid lupus–were included in the GBD 2010 "other skin and subcutaneous diseases" category.

Broad scientific themes of skin grant proposals were grouped as basic science (animal subjects or nonanimal subjects) or clinical research (subcategories: etiology, prevention, detection/diagnosis/treatment). Grants were also placed into several additional categories including: training programs, conferences, and research/core center. If grants were assigned to more than 1 category, the full grant amount was counted in each individual category.

NIH funding for the 15 skin diseases was subcategorized into a total of 20 associated funding US NIH Institutes and Centers (ICs) (Supplemental Table I, available at http://www.jaad.org).[20] If a "Funding IC" category was not listed on the exported Excel document (Microsoft, Redmond, WA), the project title link was accessed, the "Details" tab was selected, and "Administering Institutes or Centers" was used as "Funding IC."

All data were extracted and categorized by 2 authors (E. L. H. and S. P.) in August 2014. The studies were cross-examined by each author, with consensus review by senior author (R. P. D.) to resolve discrepancies. The number of grants and proportion of NIH funding for each skin condition were matched to the respective US DALY metric.[21] Matching was accomplished by creating a data plot of funding versus disability to generate a linear line of best fit with correlation coefficient, and qualitatively determining those conditions that were well or poorly matched (overfunded and underfunded), compared with respective DALY metrics.

As this study did not involve human subjects, institutional review board approval was not necessary. Additional supplementary eTables listing all NIH funded cutaneous projects assigned to each skin condition are available by contacting the corresponding author.

RESULTS

During 2012 to 2013, the NIH supported 1108 grants covering the 15 skin conditions at a total of $388 million, constituting 0.98% of total NIH-issued grants and 0.77% of total NIH funding. Comparing DALY disability estimates with disease funding, melanoma, NMSC, and leprosy were overfunded (Fig 1 and Table I). Dermatitis, acne vulgaris, pruritus, urticaria, decubitus ulcer, fungal skin diseases, alopecia area, cellulitis, and scabies were underfunded. Burden and funding appeared well matched for bacterial skin diseases, viral skin diseases, and psoriasis.

Melanoma surpassed all of the skin diseases with the largest proportion of NIH skin disease funding and grants awarded (476 and 49.53%, respectively). NMSC had the second highest funding (13.47% of funding, 194 NIH grants), followed by viral skin diseases (6.42% of funding, 68 NIH grants). Dermatitis represented the highest burden of disease but ranked fifth in dollar allocation with 5.22% of total funding.

Urticaria, the seventh most disabling condition, received the lowest amount of funding (0.29% of funding, 6 NIH grants). Similarly, acne vulgaris ranked fourth in disability but encompassed only 0.54% of total funding (11 grants), whereas leprosy, the lowest disease burden, ranked eighth of 15 (3.18% of total funding, 26 grants). Infectious dermatologic conditions of bacterial (excluding

Table I. Categorization of National Institutes of Health grants, funding, and US Global Burden of Disease disability-adjusted life year metrics

Category	*ICD-10* codes populating disease category in GBD[11]	Funding* (percent)†	No. of NIH grants in 2012 and 2013	US DALY‡ 2010 absolute No.§ (percent of total US skin condition DALYs)	US DALY 2010 skin disease rank//	NIH funding 2012 to 2013 rank
Dermatitis including eczema	L20-L27¶	$20,209,950.00 (5.22)	53	390,233 (0.19)	1	5
Nonmelanoma skin cancer	C44, D04	$52,197,220.00 (13.47)	194	230,918 (0.11)	2	2
Melanoma	C43, D03, D48.5	$191,877,157.00 (49.53)	476	220,168 (0.11)	3	1
Acne vulgaris	L70	$2,082,980.00 (0.54)	11	205,356 (0.10)	4	14
Pruritus	L29	$17,594,004.00 (4.54)	48	134,569 (0.066)	5	6
Viral skin disease	B00, B07-B09	$24,886,829.00 (6.42)	68	116,972 (0.057)	6	4
Urticaria	L50	$1,138,226.00 (0.29)	6	108,983 (0.053)	7	15
Decubitus ulcer	L89	$3,982,251.00 (1.03)	14	84,763 (0.042)	8	11
Fungal skin diseases	B35, B36.0, B36.1, B36.2, B36.3, B36.8, B36.9	$3,995,582.00 (1.03)	11	70,655 (0.035)	9	10
Psoriasis	L40-L41	$12,838,552.00 (3.31)	50	64,342 (0.032)	10	7
Alopecia areata	L63.0, L63.1, L63.8, L63.9	$2,127,599.00 (0.55)	8	58,662 (0.029)	11	13
Cellulitis	L03.0, L03.1, L03.2-L03.9	$2,738,655.00 (0.71)	6	46,772 (0.023)	12	12
Abscess, impetigo, and other bacterial skin diseases	L00, L01, L02, L04, L08, L88, L97, L98.0-L98.4	$8,030,987.00 (2.07)	26	42,745 (0.021)	13	9
Scabies	B66	$708,100.00 (0.18)	2	24,109 (0.012)	14	16
Leprosy	A30, B92	$12,340,450.00 (3.18)	26	2.77 (0.00000014)	15	8
Other skin and subcutaneous diseases	B85, B87, B88, L05.0, L05.9, L10-L13, L28, L30, L42-L44, L51, L52-L53, L55-L60, L64-L68, L71-L75, L80-L85, L87, L90-L92, L93, L94-L95	$30,662,580.00 (7.91)	109	240,645 (0.12)	N/A	3

Arranged in order of decreasing US DALY.

DALY, Disability-adjusted life year; *GBD*, Global Burden of Disease 2010 study; *ICD-10*, *International Statistical Classification of Diseases, 10th Revision*; *N/A*, not available; *NIH*, National Institutes of Health.

*For fiscal years 2012 and 2013, includes total cost by IC and total cost (subprojects).

†Total funding for all NIH skin categories is $397,466,551.00.

‡All ages.

§Rounded to nearest integer.

//Of 15 disease categories studied by GBD 2010.

¶L28 excluded from this category; kept in "other skin and subcutaneous disease" category.

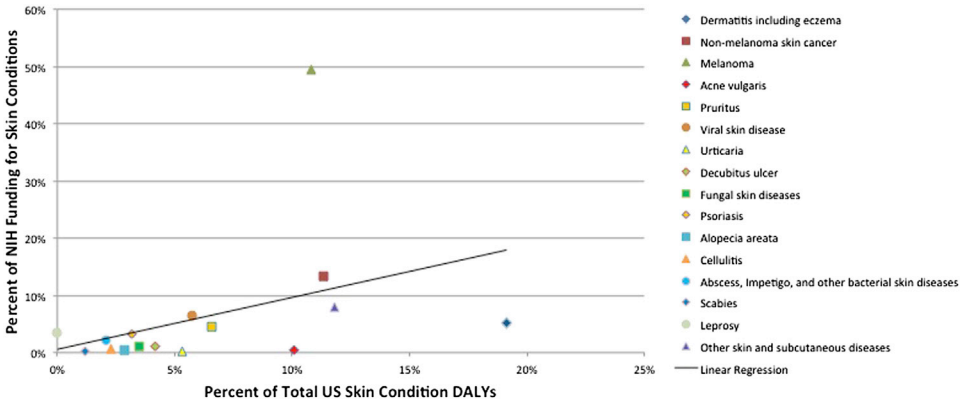

Fig 1. National Institutes of Health (*NIH*) skin funding compared with Global Burden of Disease (GBD) study 2010 disability-adjusted life year (*DALY*) estimates. Scatterplot of the percent of NIH skin funding from 2012 to 2013 compared with percent of total US skin condition DALY estimates from the GBD 2010 Study.

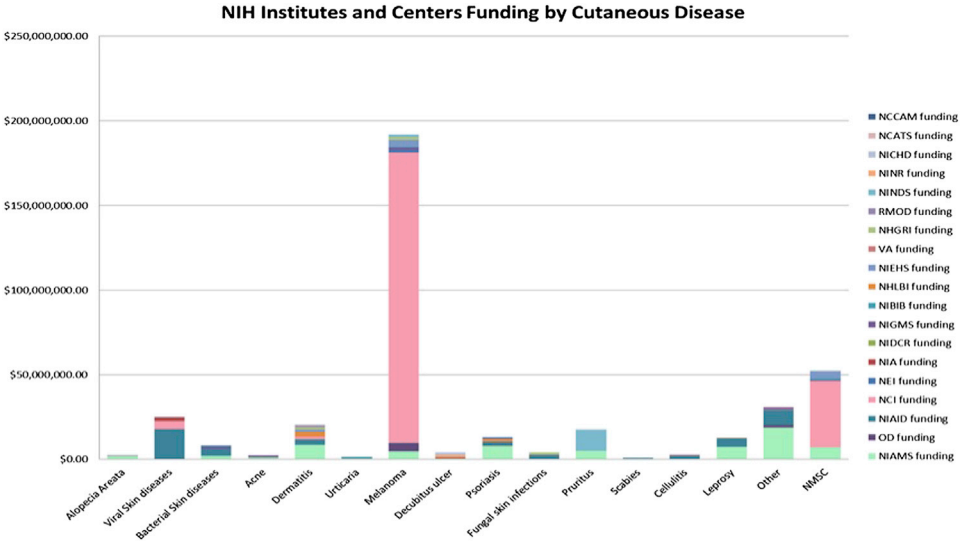

Fig 2. National Institutes of Health (NIH) and centers funding by cutaneous disease. Divisions of the NIH that are providing funding for each respective skin disease. *NCCAM*, National Center for Complementary and Alternative Medicine; *NCATS*, National Center for Advancing Translational Sciences; *NICHD*, National Institute of Child Health and Human Development; *NINR*, National Institute of Nursing Research; *NINDS*, National Institute of Neurological Disorders and Stroke; *RMOD*, Roadmap Initiative, Office of the Director; *NHGRI*, National Human Genome Research Institute; *VA*, Department of Veterans Affairs; *NIEHS*, National Institute of Environmental Health Sciences; *NHLBI*, National Heart, Lung, and Blood Institute; *NIBIB*, National Institute of Biomedical Imaging and Bioengineering; *NIGMS*, National Institute of General Medical Sciences; *NIDCR*, National Institute of Dental and Craniofacial Research; *NIA*, National Institute on Aging; *NEI*, National Eye Institute; *NCI*, National Cancer Institute; *NIAID*, National Institute of Allergy and Infectious Diseases; *OD*, Office of the Director; *NIAMS*, National Institute of Arthritis and Musculoskeletal and Skin Diseases; *NMSC*, nonmelanoma skin cancer.

leprosy) and viral skin diseases were well matched (2.07% and 6.42%, respectively). The "other skin and subcutaneous diseases" category included 45 total conditions, of which 15 were funded, and received the third highest NIH allocation (7.91%, 109 grants). Within the category, pemphigoid (*International Statistical Classification of Diseases, 10th Revision* code L12) disorder received the highest proportion of funding (37.76%).

When examining the NIH IC funding, similar patterns were evident in the highest funded cutaneous diseases (Fig 2 and Supplemental Table I). The National Cancer Institute was the highest funding institute contributing 78.94% of total NIH funding to

Table II. Broad scientific themes of National Institutes of Health–funded skin grants from 2012 to 2013

Category	No. of grants	Total skin funding, %
Basic science (nonanimal)	376	32.4
Basic science (animal)	315	24.0
Clinical: detection, diagnosis, and treatment	159	15.3
Clinical: etiology	74	9.5
Clinical: prevention	54	4.5
Basic science and clinical: detection, diagnosis, and treatment	22	3.1
Basic science and clinical: etiology	15	.98
Basic science and clinical: prevention	13	.98
Conference	15	.04
Core center	30	5.5
Training program	35	3.6

Table III. National Institutes of Health funding (2012 to 2013) for animal versus nonanimal studies by skin condition

Disease category	No. of animal studies	Total disease funding, %	Rank (total funding percent)
Dermatitis including eczema	14	35.4	4
Nonmelanoma skin cancer	79	38.8	3
Melanoma	106	21.8	6
Acne vulgaris	3	21.3	8
Pruritus	29	57.9	1
Viral skin disease	12	13.1	12
Urticaria	0	0	—
Decubitus ulcer	3	14.5	10
Fungal skin diseases	0	0	—
Psoriasis	11	21.7	7
Alopecia areata	2	34.9	5
Cellulitis	0	0	—
Abscess, impetigo, and other bacterial skin diseases	5	17.7	9
Scabies	0	0	—
Leprosy	2	13.2	11
Other skin and subcutaneous diseases	54	41.8	2

Arranged in order of decreasing disability-adjusted life year.

melanoma (Fig 2). The National Institute of Arthritis and Musculoskeletal and Skin Diseases contributed the second highest funding of $64,329,536 to 202 projects across 13 skin conditions.

A diversity of scientific themes was represented among the skin conditions. Basic science received greater allocation than clinical research: detection/diagnosis/treatment research (56.4% and 15.3%, respectively) (Table II). Conferences received the lowest funding (0.04% of total funding, 15 grants). Fifty projects included both a basic science and clinical focus. Basic science studies using animal models encompassed 24% of total funding allocation. Pruritus, "other skin and subcutaneous diseases," and NMSC had the highest number of animal studies (57.9%, 41.8%, and 38.8%, respectively) (Table III).

DISCUSSION

This study used burden of disease metrics from the open-access GBD 2010 database to investigate prioritization of cutaneous research funded by the NIH. These epidemiologic data have the potential to inform priority-setting methods and impact policy making. Countries around the world have established collaborations with the GBD Institute for Health Metrics and Evaluation to incorporate disease burden into policy discussions.[22]

Nevertheless, there are important limitations of using GBD to inform or influence NIH spending. As a major US-based research organization, the NIH may consider differences in US-specific disease burden with global disease burden when setting research priorities. For example, melanoma causes significantly greater disease burden and mortality in developed regions such as North America and Europe, when compared with developing regions in Africa, Asia, and South America.[23] Melanoma NIH funding vastly exceeded all other skin conditions with almost half of total allocation and appeared overfunded when compared with disease burden. Although over 80% of malignant melanoma is diagnosed in early stages, patients with advanced disease use 34% to 55% of total cost and experience tremendous distress.[24] There are only a handful of Food and Drug Administration–approved treatment options for metastatic melanoma, and many NIH studies focused on targeting biochemical pathways and novel therapeutic regimens.

The DALY metric for skin diseases only considers disability from the cutaneous aspect of each skin condition; it does include disability related to other organ systems. For example, decubitus ulcers as a result of venous insufficiency cause significant morbidity beyond their cutaneous disfigurement, including reduced ankle range of motion.[25] Alopecia areata has been linked to a strong autoimmune comorbidity, including hypothyroidism and diabetes mellitus, but these comorbidities were not factored into its rank.[26] Dermatitis is well established with persistent loss of sleep cycle, intractable pruritus, stress, and impact on social interactions.[27-31] Thus, the

GBD metric likely grossly underestimates the true burden from these skin conditions.

Lobbying by specific disease interest groups such as the Melanoma Research Foundation and National Psoriasis Foundation may contribute to increased allocations for certain diseases.[32,33] Pharmaceutical companies and private corporations, such as the National Eczema Association and the American Acne and Rosacea Society, also sponsor research projects.[34,35] Therefore, many nongovernmental agencies may be funding research on diseases that appear underfunded by the NIH.

The availability of treatment options for a particular disease may also impact research prioritization by the NIH. Conditions with validated and established therapies, even with high disease burden, may warrant less NIH funding dollars than conditions with moderate disease burden but lacking treatment options. A potential example is the overfunding of melanoma research and the underfunding of dermatitis research by the NIH when compared with GBD metrics. As already mentioned, dermatitis is responsible for the highest disease burden of the 15 skin conditions but ranked number 5 in NIH funding. A variety of well-established therapies are the standard of clinical practice for dermatitis, including emollients, topical corticosteroids, and topical calcineurin inhibitors.[36] In contrast, although melanoma is responsible for the third-greatest disease burden in the United States, well-established therapies for the most morbid aspect of the disease, metastatic melanoma, are needed. Melanoma was allocated the greatest amount of NIH funding dollars of the 15 skin conditions, and in recent years, novel therapies for metastatic melanoma have become a hotbed for research.[37]

The NIH may prioritize lower burden disease areas that are on the verge of a breakthrough or that may effect change and overcome health inequalities.[38] For the 15 skin conditions, approximately 60% of NIH research funding was devoted to basic science research. National funding in the United Kingdom has experienced a recent decline in basic science research funding from 68.3% in 2004/2005 to 59.4% in 2009/2010.[39] It is postulated that this decline is a result of retrospective analyses suggesting that clinical research has the most beneficial effect on patient care.[40] In addition, recent systemic reviews of animal studies propose that the design, quality, and relevance of animal studies are questionable.[41,42] For example, a survey of 271 animal studies found only 12% report random allocation and only 14% of studies used blinded investigators.[41]

The NIH, along with other national funding bodies, has a duty to look forward to and anticipate priorities that will emerge in future years. Temporal change in DALY reveals important patterns in disease epidemiology that may guide priority-setting decisions. As an example, NMSC can cause an expected future burden as the US population ages. The age-standardized DALY for NMSC increased 40% from 1990 to 2010, whereas melanoma decreased by 15% over the same time period.[43]

Assigning each NIH project to a particular skin condition does not take into consideration that fundamental or clinical research on one disease may aid the understanding or treatment of other diseases. The relatively large amount of NIH funding for leprosy compared with its disease burden highlights the use of *Mycobacterium leprae* animal models to study cell-mediated immunity to better understand immunoregulatory mechanisms of infection. This research has broad applications to bacterial, viral, and fungal skin diseases.[7,44,45]

Although the NIH issues funding announcement opportunities via requests for proposals, these research endeavors are limited by the number of researchers working in each disease area. For example, urticaria, the most common dermatologic disorder in the emergency department, may be responsible for high disease burden, but has few researchers working on it.[8] Although many factors influence research prioritization, we suggest that burden of disease makes a good starting point for discussion.

Finally, the current study included an investigation of grants supported by the NIH only during the 2012 to 2013 fiscal years; thus, extrapolation of data to previous decades is limited. Assignment of a project to a particular disease category introduced some degree of subjectivity, although this was minimized through independent analyses by 2 study authors.

Future directions for the NIH may include adopting principles set forth by other organizations. The Patient-Centered Outcomes Research Institute operates under 3 goals: (1) increase the quantity, quality, and timeliness of comparative research; (2) accelerate implementation of research evidence; and (3) promote patient-centered research projects. Results that are patient-centered and likely to change clinical practice are given high priority; NIH goals lack both of these criteria.[46] The Health Technology Assessment program in the United Kingdom also provides an exemplary priority-setting process. Health Technology Assessment uses evidence via published systematic reviews linked to cost-effectiveness on a particular

topic. In addition, recommendations from physicians and policy makers for commissioned research are thoroughly analyzed. Health Technology Assessment operates on a fine balance between commissioner- and researcher-led projects, all the while accounting for cost-effectiveness and public health relevance.[47] Although a variety of models and factors contribute to research prioritization, increasing transparency of any priority-setting process is important to ensure proper allocation of limited research dollars.

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Supplemental Table I. Representation of NIH funding institutes and centers for each cutaneous diagnosis (numbers expressed as percent of total NIH skin condition funding)

Funding category	Alopecia areata	Viral skin disease	Bacterial skin disease	Acne	Dermatitis	Urticaria	Melanoma	Decubitus ulcer	Psoriasis	Fungal skin infections	Pruritus	Scabies	Cellulitis	Leprosy	Other	NMSC
NIAMS	93.44	0.19	22.94	45.82	41.63	31.83	2.39	8.80	61.08		27.98			59.49	61.48	13.07
NIAID		71.31	51.44	9.87	15.61	58.66	0.01		16.18	54.78		100.00	81.50	39.61	29.39	
NIGMS		0.60	20.64	32.91	0.90		0.64			5.90					3.93	1.48
OD	6.56			11.40			2.51		1.82		0.23				4.35	0.40
NCI		18.69			6.97		89.61						18.50		0.58	74.93
NIBIB			4.99			9.51	0.10									1.54
NIEHS					7.32		2.20								0.03	8.57
NIA		8.31						14.50							0.14	
NHLBI					13.77				11.00					0.91		
NHGRI					7.35		0.99			37.16						
NEI		0.73					0.83									
NINDS							0.72				71.78					
NCATS									3.10						0.05	
NIDCR		0.17								2.15						
RMOD					6.45											
NINR								37.66								
NICHD								39.05								
NCCAM									6.82							

Numbers expressed as percent of total National Institutes of Health skin condition funding.

NIAMS, National Institute of Arthritis and Musculoskeletal and Skin Diseases; *NIAID*, National Institute of Allergy and Infectious Diseases; *NIGMS*, National Institute of General Medical Sciences; *OD*, Office of the Director; *NCI*, National Cancer Institute; *NIBIB*, National Institute of Biomedical Imaging and Bioengineering; *NIEHS*, National Institute of Environmental Health Sciences; *NIA*, National Institute on Aging; *NHLBI*, National Heart, Lung, and Blood Institute; *NHGRI*, National Human Genome Research Institute; *NEI*, National Eye Institute; *NINDS*, National Institute of Neurological Disorders and Stroke; *NCATS*, National Center for Advancing Translational Sciences; *NIDCR*, National Institute of Dental and Craniofacial Research; *RMOD*, Roadmap Initiative, Office of the Director; *NINR*, National Institute of Nursing Research; *NICHD*, National Institute of Child Health and Human Development; *NCCAM*, National Center for Complementary and Alternative Medicine; *NMSC*, nonmelanoma skin cancer.