Implementation Science in Cancer Prevention and Control: A Decade of Grant Funding by the National Cancer Institute and Future Directions

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Background

The National Cancer Institute (NCI) has long supported innovative cancer prevention and control research leading to the development of numerous efficacious interventions for overall improvements in cancer screening, tobacco cessation, and promoting nutrition, physical activity, and sun safety.

Traditional efficacy research in cancer and other health problems is conducted under highly controlled conditions. It is often slow, costly, or insufficiently generalizable to provide useful evidence to decision makers that can be translated into complex, real world settings.

Inadequate attention to the implementation process has resulted in an enormous gap between evidence generated and the evidence implemented. Implementation Science emerged out of the need to identify strategies to disseminate and implement evidence-based interventions into practice in order to effectively reach populations in need and to improve health outcomes.

Purpose of this analysis:

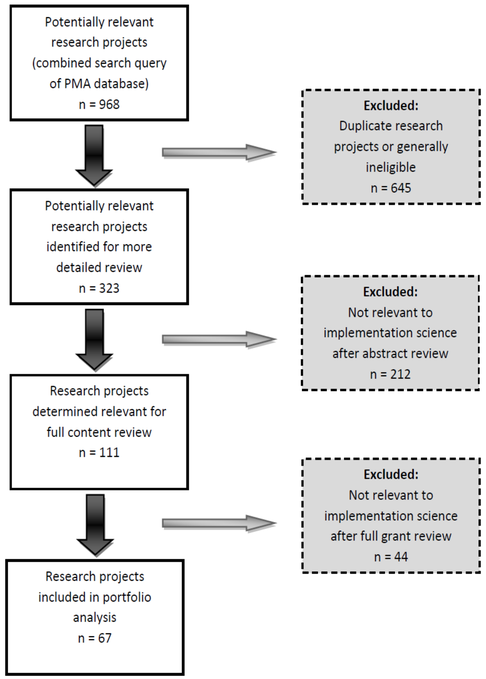
- Explore application of Implementation Science across the cancer control continuum, including prevention, screening, treatment, and survivorship.
- Examine funding trends of Implementation Science grants funded by NCI between 2000- 2012.
- Assess study characteristics including cancer topic, position on the T2-T4 translational continuum, intended use of frameworks, study design, settings, methods, and replication and cost considerations.

Methods

- Text search query in NCI's extramural portfolio database **Portfolio Management Application (PMA)**
- Search terms based on the NIH definition of Implementation Science terms described in the Program Announcement for Dissemination & Implementation Research in Health (DIRH):
  - *Dissemination* is "the targeted distribution of information and intervention materials to a specific public health or clinical practice audience"
  - *Implementation* is "the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings"
- Query included abstracts and titles of all awarded NCI grants using multiple combinations of the following terms: *dissemination, implementation, diffusion, pragmatic research, translation research, and translational research*.
- Duplicative grants were removed.

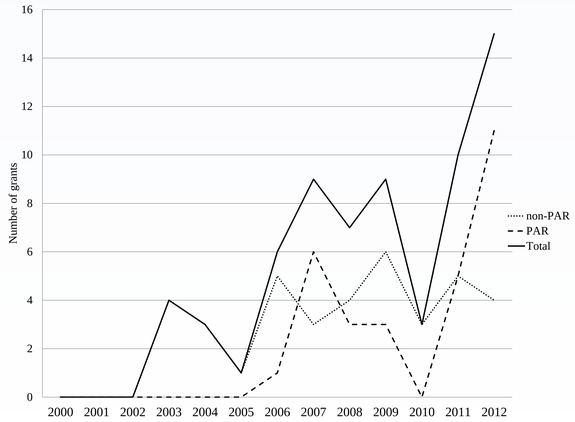
To learn more visit: http://cancercontrol.cancer.gov/is/

Selection Process for Grants to Review



Trends in Funding Implementation Science

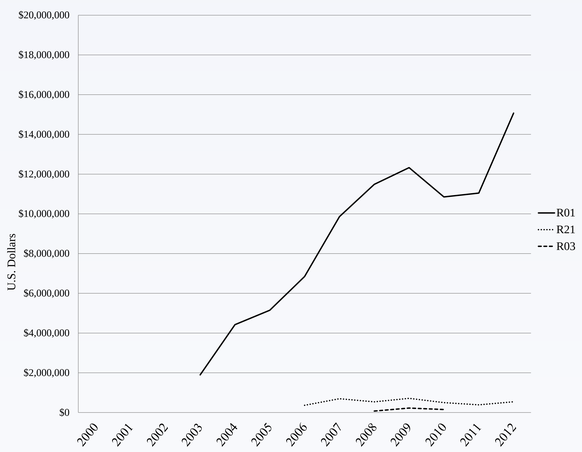
Trends of grants awarded in IS by the National Cancer Institute, fiscal years 2000-2012 (DIRH PAR* vs. other announcements)



* DIRH PAR stands for Dissemination and Implementation Research in Health Program Announcement.

Funding Trends by Grant Mechanism

Funding trends of implementation science by grant mechanism funded by the NCI, fiscal years 2000-2012



Award Amounts by Program Announcement

Implementation science awards by program announcement and grant mechanism funded by the NCI, fiscal years 2000-2012

Announcement	Mechanism	Funds	Number of awards (%)	Average cost per grant	Average cost per grant per year
DIRH PAR*	R01	$25,157,077	20 (69)	$1,257,854	$545,627
	R21	$2,778,562	8 (28)	$347,320	$187,859
	R03	$150,000	1 (3)	$150,000	$75,000
	Totals	$28,085,639	29		
Other Announcements	R01	$63,790,377	27 (82)	$2,362,607	$564,723
	R21	$952,411	4 (12)	$238,103	$119,051
	R03	$300,500	2 (6)	$150,250	$75,125
	Totals	$65,043,288	33		
Overall	R01	$88,947,454	47 (76)	$1,892,499	$556,597
	R21	$3,730,973	12 (19)	$310,914	$164,923
	R03	$450,500	3 (5)	$150,167	$75,083
	Totals	$93,128,927	62		

* DIRH PAR stands for Dissemination and Implementation Research in Health Program Announcement.
** Funding for projects recently awarded in 2013 are not included.

Characteristics of D&I Grants Funded by NCI

Number and percentage of NCI implementation science research grants by study characteristics, fiscal years 2000-2012

Characteristic		Number of grants*	Percent of grants*
Cancer control continuum	Prevention	33	49.3
	Screening	27	40.3
	Diagnosis	0	0.0
	Treatment	3	4.5
	Survivorship	4	6.0
	Cross-cutting	7	10.4
Types of cancer/risk factors	Colorectal cancer	20	29.9
	Breast cancer	12	17.9
	Cervical cancer	8	11.9
	Tobacco	26	38.8
	Physical activity	6	9.0
	Diet/nutrition	5	7.5
	Sun safety	5	7.5
	Public health genomics	4	6.0
	Obesity	3	4.5
Implementation science objectives	Dissemination	31	46.3
	Adoption	20	29.9
	Implementation	53	79.1
	Sustainability	26	38.8
Sustainability indicators	Capacity building	20	29.9
	Maintenance	25	37.3
	Cost analysis	15	22.4
Place on T2-T4 continuum	T2 (efficacy studies)	8	11.9
	T3 (comparative effectiveness)	61	91.0
	T4 (outcomes research)	8	11.9
Study settings	Community	18	26.9
	Faith based	3	4.5
	School based	6	9.0
	Clinical	35	52.2
	Workplace	10	14.9
	Home based	3	4.5
	Online	7	10.4
Collaborative processes	Yes	60	90
	No	7	10
Study design	Experimental, randomized control trial	39	58.2
	Experimental, nonrandomized trial	5	7.5
	Observational	21	31.3
	Modeling	2	3.0
Methods used	Qualitative	54	80.6
	Quantitative	59	88.1
	Comparative effectiveness	35	52.2
	Cost analysis	18	26.9
	Simulation models	2	3.0
	Network analysis	1	1.5
Frameworks/Models	RE-AIM	23	34.3
	Diffusion of Innovation	26	38.8
	Organizational Change	7	10.4
	Systems/Network Theories	5	7.5
	Chronic Care Models	7	10.4
	Model of Diffusion in Service Organizations	3	4.5
How was the model used?	Intervention design	48	71.6
	Formative research	22	32.8
	Measured variables	41	61.2
	Only stated	5	7.5
Replication costs considerations	Yes	33	49.3
	No	31	46.3
	NA	3	4.5

* Numbers add up to more than 67 (100%) in some cases because a given grant may fit into more than one category.

Conclusions

Implementation Science research in cancer control is active and diverse, but could be enhanced by pragmatic design features, improved understanding of key constructs and their relationships within implementation science frameworks, and harmonized measures that are valid, reliable, and practical.