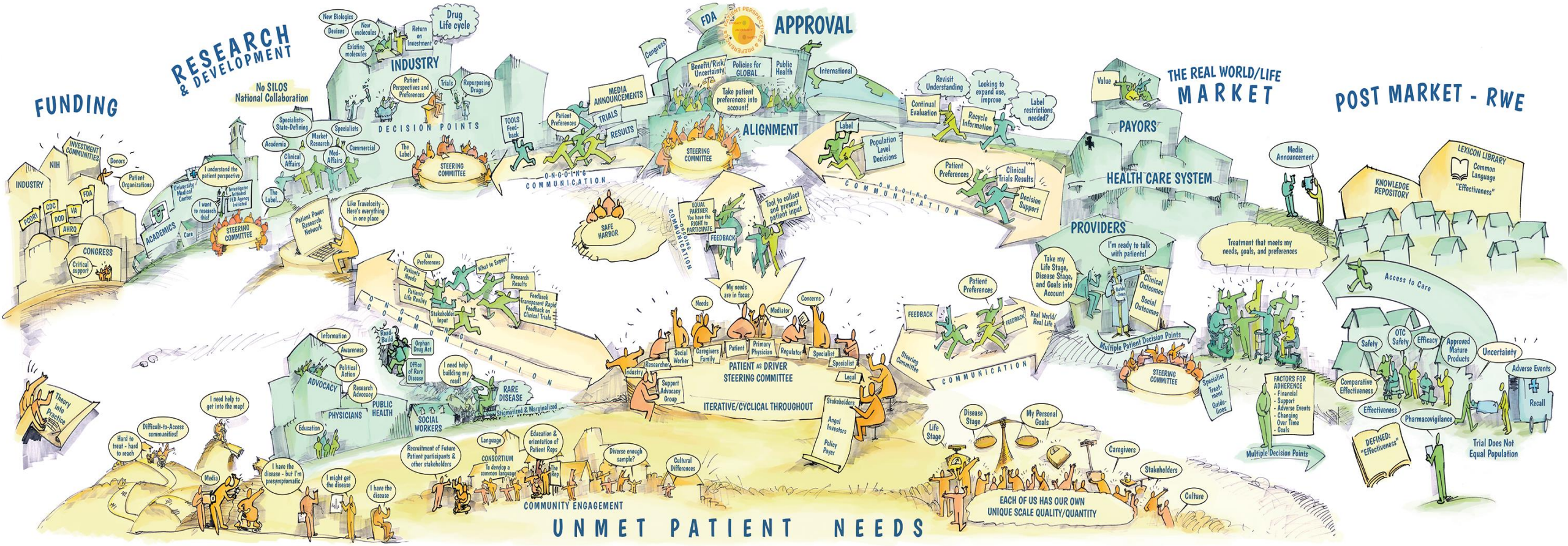
Capturing the Value of Patient Engagement:

Summary of Results of the 2016 Study of Patient-Centric Initiatives in Drug Development

January 31, 2017

DIA DEVELOP INNOVATE ADVANCE

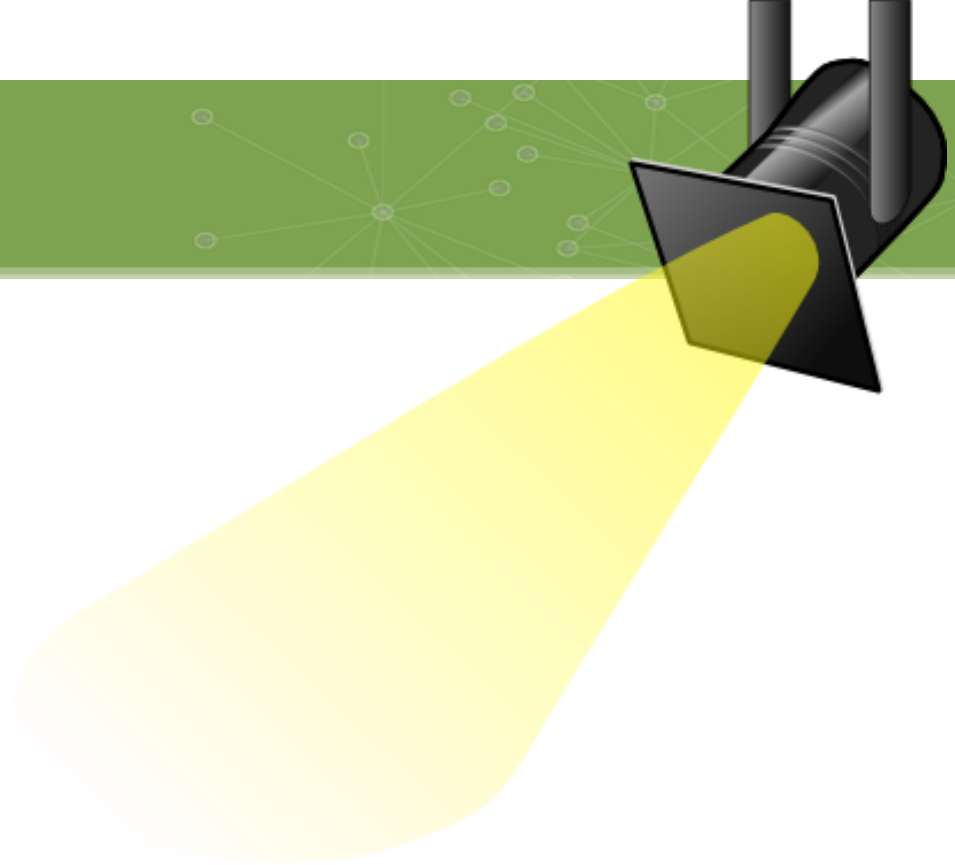
Patient Engagement in the Lifecycle of Medical Products



COLOR KEY

- **Green**: denotes aspects of patient engagement in place, with efforts begun
- **Yellow**: denotes aspects that are not now in practice but should be implemented in the medical product life cycle for effective and meaningful patient engagement.

Today's Agenda



Key Insights

Research Findings

Disseminating Results

Next Stage of Research

Your Questions & Comments

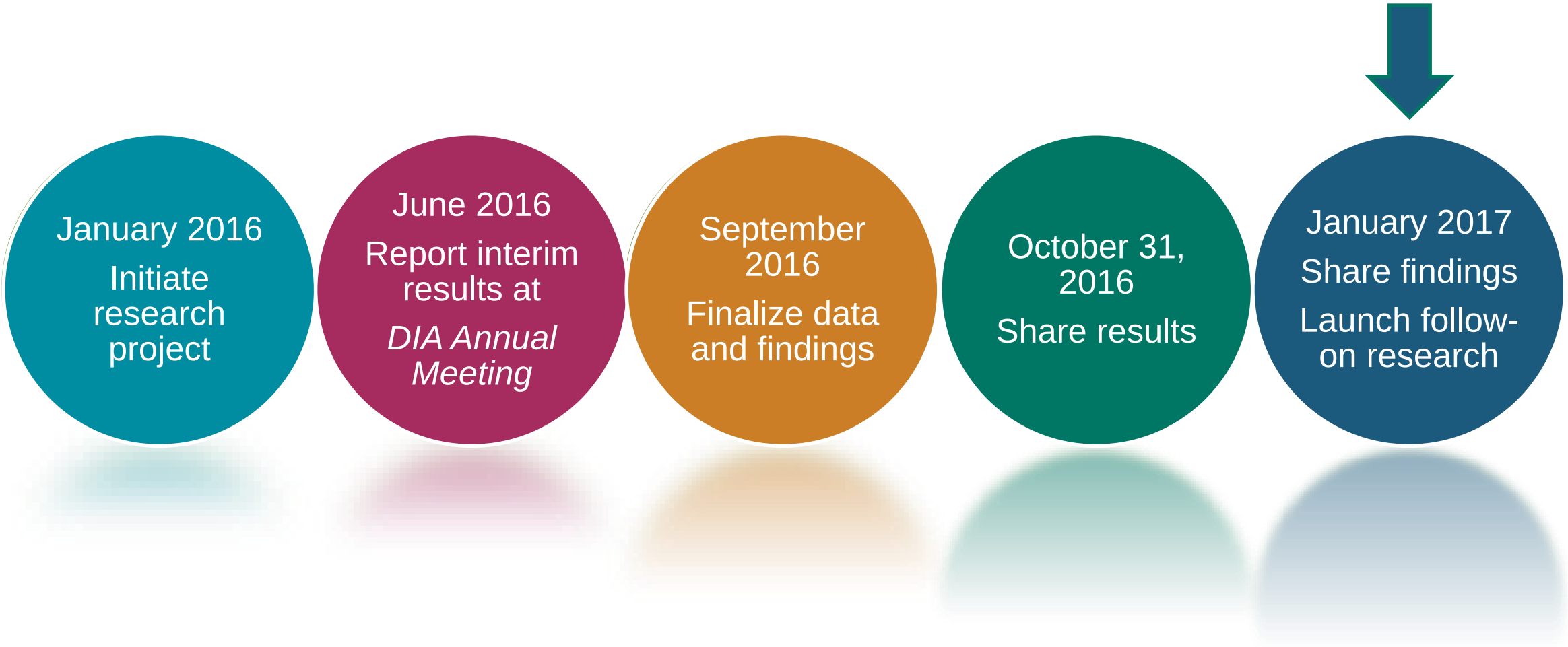
In Collaboration With

Working Group Companies

Science For A Better Life

DIA

Timeline for Study



Objectives of the Research

- Quantify the impact of patient-centric initiatives to derive ROE
  - Based on retrospective data from actual experience
- Assess adoption of various patient-centric
- Characterize management and organizational models
- Identify guidance and frameworks to inform implementation

Key Insights

- 121 actual case examples containing several hundred metrics identified and analyzed
  - Low cost engagement initiatives generate the highest ROE; high tech initiatives show lower ROE
  - Metrics are not uniformly defined, making it hard to compare and generalize at this time

- ROE metrics show that:
  - Trial performance improves (faster planning, approval, enrollment; fewer protocol amendments)
  - More positive study volunteer feedback; Patient Activation Measures (PAM) scores are higher
  - Long-term savings across drug development portfolio

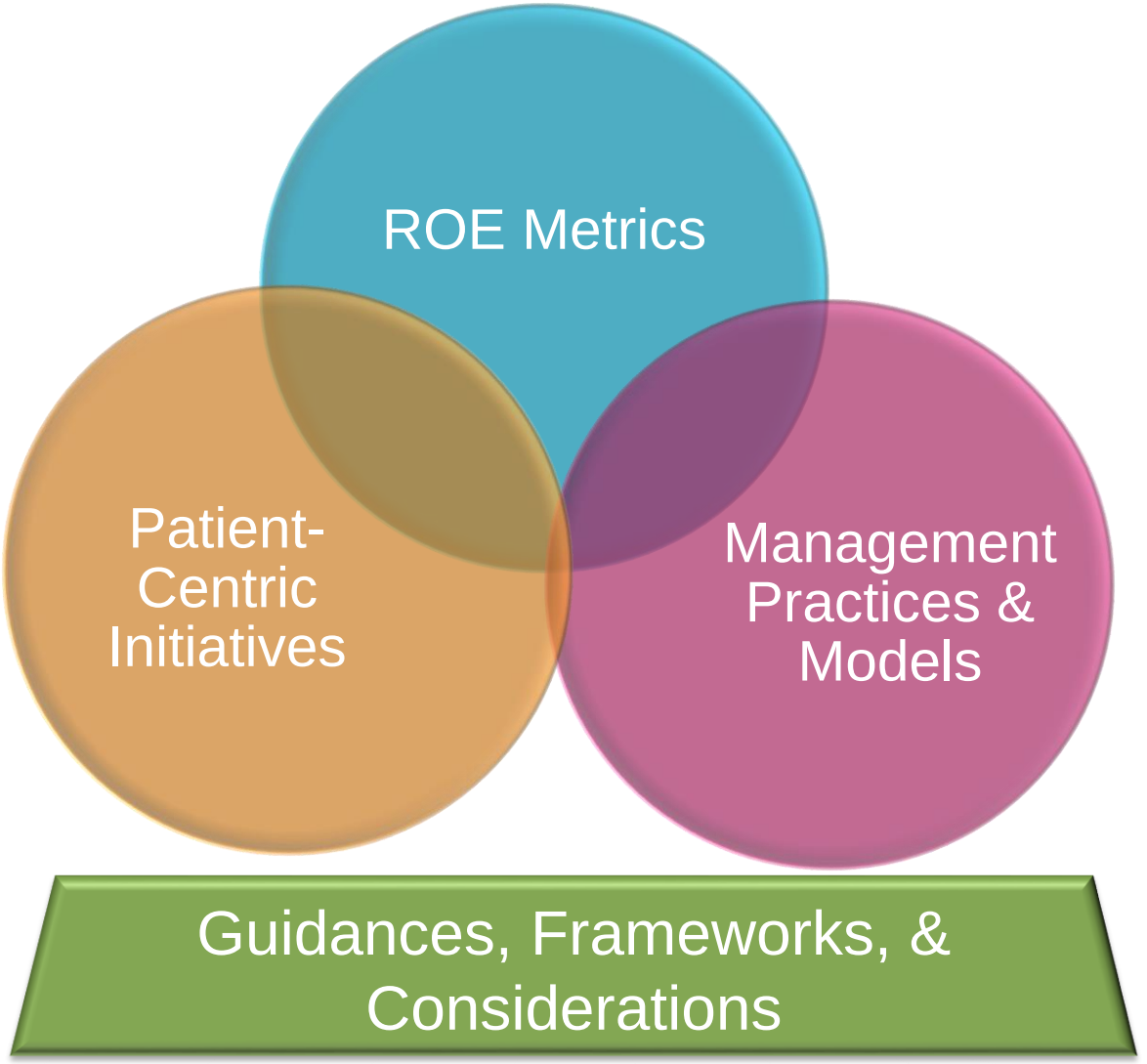
Key Insights *(continued)*

- Most widely adopted engagement initiatives include patient advisory boards, site advisory boards, clinical trial results summaries
  - A high percentage of companies are piloting end-of-trial surveys and the use of wearable devices
  - Poor internal buy-in and inadequate authority to implement are primary adoption barriers
- Wide variation observed in organizational models supporting the implementation of patient engagement initiatives
- Regulatory agencies, disease organizations and private sector companies have all embraced patient centricity, and they are all developing frameworks and resources

Research Methodology

- Conduct industry survey
  - to map landscape of patient centric initiatives
  - to examine organizational roles/structures and management practices
- Interview company representatives on management strategy and practices
- Collect case studies of patient-centric approaches
- Conduct metrics toolkit feasibility survey
- Identify available guidance and frameworks

Components of the Research



Return on Engagement Toolkit

Long-Term Drug Development Portfolio

- **PCI* Cost** (e.g. total cost; cost per trial; percentage of overall trial cost; cost per evaluable patient; cost per submission program)
- Overall **development timelines** (includes time to go/no-go decisions; comparisons to traditional trial timelines)
- Overall **program success rate** relative to portfolio benchmark
- **Regulatory activity** with study volunteers

Internal and External Reach

- Total **number of PCIs** implemented
- Total **number of trials** using PCI (overall and percent of total trials; planned and completed)
- Total **number of study volunteers** / PAGs involved **in PCI** (e.g. # ambassadors; # alumni)

Study Volunteer Feedback

- **Study volunteer feedback and satisfaction** to FDA/ site/sponsor on study drug/ clinical trial (e.g. interviews; surveys; QOL / PRO; % positive responses over total; perspective on important procedures; receptivity to protocol; types and number of missed assessments)
- Total **number of changes** (e.g. protocol; communication and program positioning) from study volunteer feedback and how changes impacted program/study design

Trial Performance

- Study volunteer metrics (e.g. screening, **recruitment,** and **retention rates**)
- **Trial cycle times and length**
- Number of **protocol amendments** and changes from amendment
- Whether clinical trial went into **rescue** when using PCI
- Changes in **protocol complexity**; # endpoints relevant to patient groups

Stratification variables:

- PCI Type
- Disease indication
- Study phase
- Maturity of PAGs

*PCI is Patient-Centric Initiative; NIHR cost tool for measuring predicted cost: http://bit.ly/20eNY44

Data and analysis provided by Tufts CSDD

Patient-Centric Initiatives† (PCI) by Category

Innovative Partnerships

- **Patient group support and involvement**
- **Patient advisory boards and focus groups***
- Professional panels
- Community conversations
- Medicine co-development partnerships with patient groups
- Patient group landscape analysis tool (disease area specific)

Protocol Design

- **Adaptive trial designs and adaptive licensing**
- **Open design and crowdsourcing**
- Patient involvement in study feasibility and design
- Protocol feasibility review committees
- Real world, practice-based clinical trials

Technology Advancements

- **Apps for clinical data collection/analytics**
- **Digital medicine****
- **Direct-to-patient clinical trials/telemedicine**
- **E-Consent**
- **Gaming**
- **Social Media/Online Engagement**
- Human factor testing/simulation
- Centralized/integrated HER & clinical records
- Patient wearable device

Study Volunteer Ease

- **Home nursing networks and logistics assistance**
- **Patient counseling and education**
- Patient trial community during trials and after trials
- Lay summary clinical trial results
- End of study surveys

Text in **RED** indicates metrics identified

† Only those PCIs reported in the case studies.

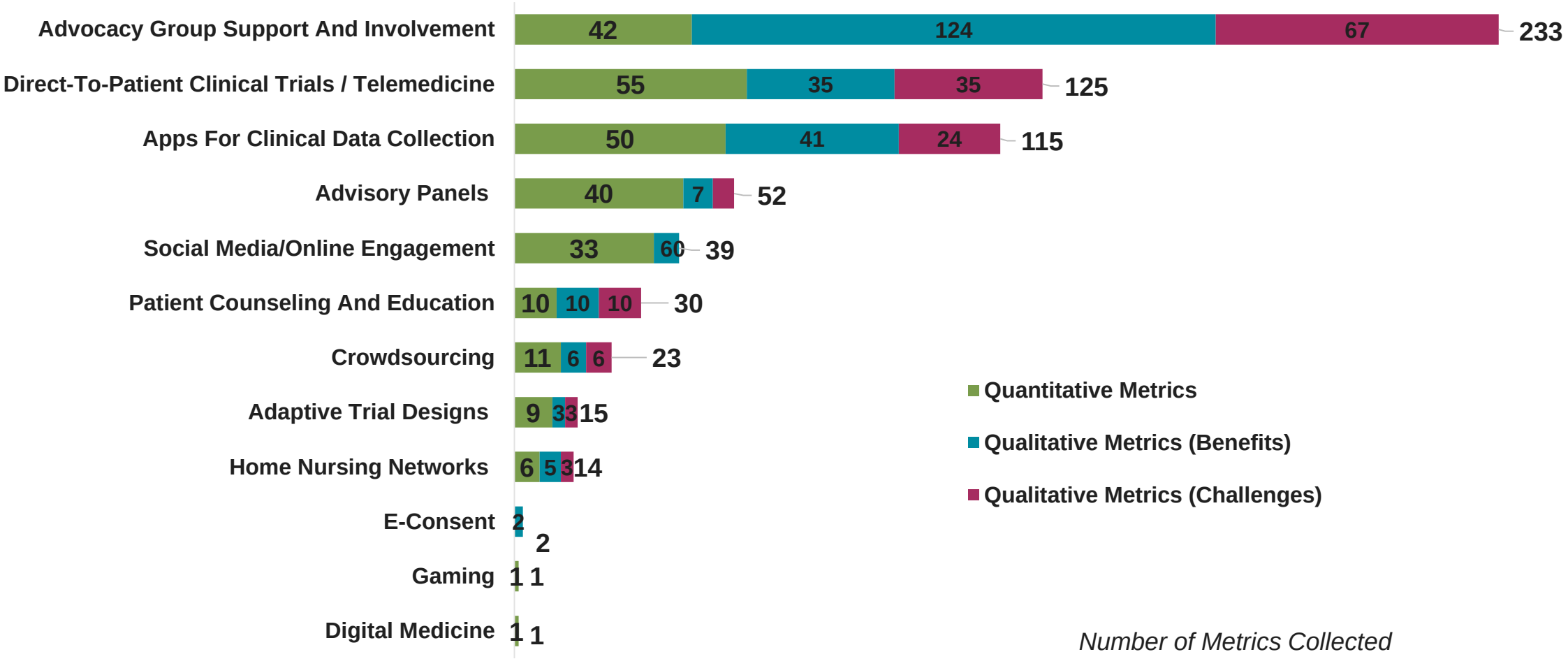
*Includes groups such as NIHR (National Institute for Health Research).

** Medicine that can be tracked using technology.

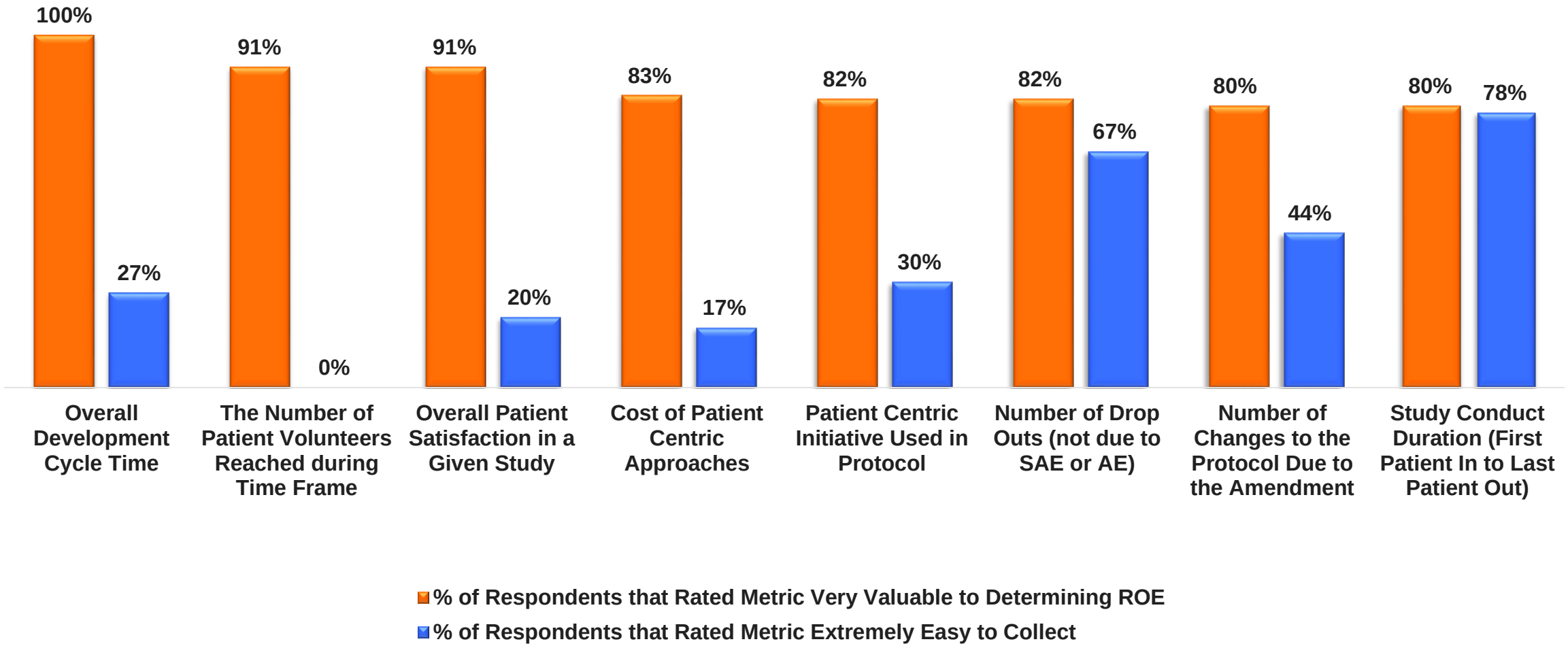
Identified and Analyzed 121 case studies

Data and analysis provided by Tufts CSDD

Types of Metrics Collected



Top ROE Metrics Collected



Summary Findings: Current Cost and Impact Overall

Patient-Centric Initiative	Cost to Conduct	Ease of Conducting	Reported Impact*	# Collected Quantitative Metrics
Advocacy Group Support and Involvement	$	1	✓✓✓	42
Patient Advisory Panels and Focus Groups	$	1	✓✓✓	40
Social Media/Online Engagement	$	1	✓✓✓	33
Patient Counseling and Education	$	2	✓✓✓	10
Adaptive Trial Designs and Adaptive Licensing	$$	3	✓✓✓	9
Open Design and Crowdsourcing	$	2	✓✓	11
Direct-To-Patient Clinical Trials / Telemedicine	$$	1	✓✓	55
Home Nursing Networks and Logistics Assistance	$$	2	✓✓	6
Apps For Clinical Data Collection	$$$	3	✓✓	50
E-Consent	$$	2	✓	0
Digital Medicine	$$$	3	✓	1
Gaming	$$$	3	✓	1

Rubric out of four dollar signs, weight lifters, or check marks. Ratings relative to each other and based on case study data.
* Impact assesses changes in quality; speed; and impact on patient.

Data and analysis provided by Tufts CSDD

Each PCI Category Maps to ROE Metrics

- Innovative Partnerships
- Protocol Design
- Technology Advancements
- Study Volunteer Ease

- Long-Term Drug Development Portfolio
- Internal and External Reach
- Study Volunteer Feedback
- Trial Performance

Case Examples of Impact from: Innovative Partnerships

Long-Term Drug Development Portfolio (N=2 metrics)

- **Cost** of working with **PAGs** / patient advisory boards **minimal**
  - up to $100K in donations
  - ~$100-$250 / patient (in-depth interviews)
  - $1K-$40K / focus group
- *"[PAGs] **saved millions of dollars**" --- CRO*
- *"**Data** [gathered] can be **used across all clinical trials**" --- Sponsor*

Internal and External Reach (N=3 metrics)

On average **1-2 PAGs** per clinical trial consulted

Focus groups / in-depth interviews consist of **~8-10 study volunteers per clinical trial**

Survey outreach range from **~200 to ~400 study volunteers**

Study Volunteer Feedback (N=55 metrics)

- Mean number of changes from **PAGs: 12.4 changes** (range: 3-17)
- Patient advisory boards have reported on average:
  - **1.3 changes** to **schedule of visits**
  - **1.5 changes** to **number of procedures**
  - **3.8 changes** to **informed consent form**
  - **7 changes** to **study positioning and communication material**

Trial Performance (N=22 metrics)

- Initial planning time: 3 months (in future should take 3 weeks)
- IRB approval: 1 month
- *"Faster study enrollment"* --- *Sponsor*
- Faster **FDA approval** of protocol
- **Randomization rates** ranging from **8%** to **100%**

53 Case Studies Found.

Data and analysis provided by Tufts CSDD

DIA

Examples of Impact from Protocol Design Input

- **Open Design/ Crowd-sourcing** reported to **reduce** clinical trials **costs** by **60%**
- **Stopping early for efficacy**
  - **Saved** the company **$4 million** on phase III trial by stopping trial 1 year early to bring drug to market early
  - Tripled company stock price
- **Sample size re-estimation (SSR)** produced on average **15% savings** of overall trial costs (20% smaller sample was required)

Long-Term Drug Development Portfolio (N=4 metrics)

- **Open Design/Crowd-sourcing** reports **strong outreach** to survey:
  - **42 – 250 patients/ advocates**
  - **50 – 60 physicians/ researchers**
- One company reports that **all Phase III trials** in company have **stopping early for futility** built in

Internal and External Reach (N=5 metrics)

- **Feedback** from **Open Design/Crowdsourcing** report:
  - **4 major changes** to protocol design
  - **5 minor changes** to protocol design

Study Volunteer Feedback (N=4 metrics)

- Survey of 63 companies using **open design/crowdsourcing report**:
  - 67% of respondents report **lessening** number of **protocol amendments**
  - 53% of respondents report **reduction** in **site work burden**
  - 44% of respondents report **improvements** in **study conduct cycle time**
- **SSR** resulted in **10% increase in timelines**

Trial Performance (N=6 metrics)

10 Case Studies Found.

Data and analysis provided by Tufts CSDD

Examples of Impact from Tech Advancements*

Long-Term Drug Development Portfolio (N=7 metrics)

- Cost varies by sophistication of app and wearable device
  - **~$30K** for bare-bones **app development**
  - **$100- $250 per wearable device**
- ***"Reduced costs by 50%"*** --- PI of study (no wearable used; using Apple Research Kit)
- **Telemedicine** studies report savings from 12% of clinical trial costs 163% increase (**median 50% savings**)

Internal and External Reach (N=9 metrics)

- **Apple Research Kit**:
  - 11,000 individuals signed up for CVD study on first day
  - Number of participants range from 1,600 to 44,841
  - 31 countries represented
- **# study volunteers using telemedicine: 1,200 – 10,600 screened; 150 – 1,200 enrolled**

Study Volunteer Feedback (N=23 metrics)

- **Telemedicine** study volunteer feedback strong (in favor)
- Positive patient feedback varies on type of wearable device
- **Gaming PROs higher** for gaming group than non-gaming group

Trial Performance (N=91 metrics)

- IRB Approval: **2.5 years** to obtain**
- **Retention rates:**
- **Watch** device: average **81%**
- **Other** device: average **63%**
- **Telemedicine**: **76%-93%**
- **Gaming: ↑by 16%**
- **E-Consent: modest improvements**
- **E-Consent** reports **minimal improvements** in comprehension
- **Telemedicine studies** report **enrollment rates from 0% to 50%**; **timeline reductions**

48 Case Studies Found.

* Excludes Social Media and Online Engagement

** Publishing platform containing informed consent, study protocol and supporting documents

Data and analysis provided by Tufts CSDD

Examples of Impact from Study Volunteer Ease

- **Logistics assistance** costs **1%** of **clinical trial budget**

Long-Term Drug Development Portfolio (N=2 metrics)

- Study using **Logistics assistance** incorporated patients from other countries into **one site instead of opening multiple sites**

Internal and External Reach (N=1 qualitative)

- **Feedback** from **Patient Counseling and Education** report:
  - Increase in PAM score
  - 70% difference in satisfaction rates (counseling group was higher)

Study Volunteer Feedback (N=2 metrics)

- Survey of 63 companies using **Patient Counseling and Education** report 85% enrollment rate:
  - *"Much of the **success** of the multifaceted and adaptive patient consent and enrollment approach is due to the **role of nursing in providing education**…"*
- **Home nursing**:
  - **300%↑** in **patient enrollment**
  - **64%↑** in **patient retention**
- **Logistics assistance: 95% retention rate**

Trial Performance (N=11 metrics)

7 Case Studies Found.

Data and analysis provided by Tufts CSDD

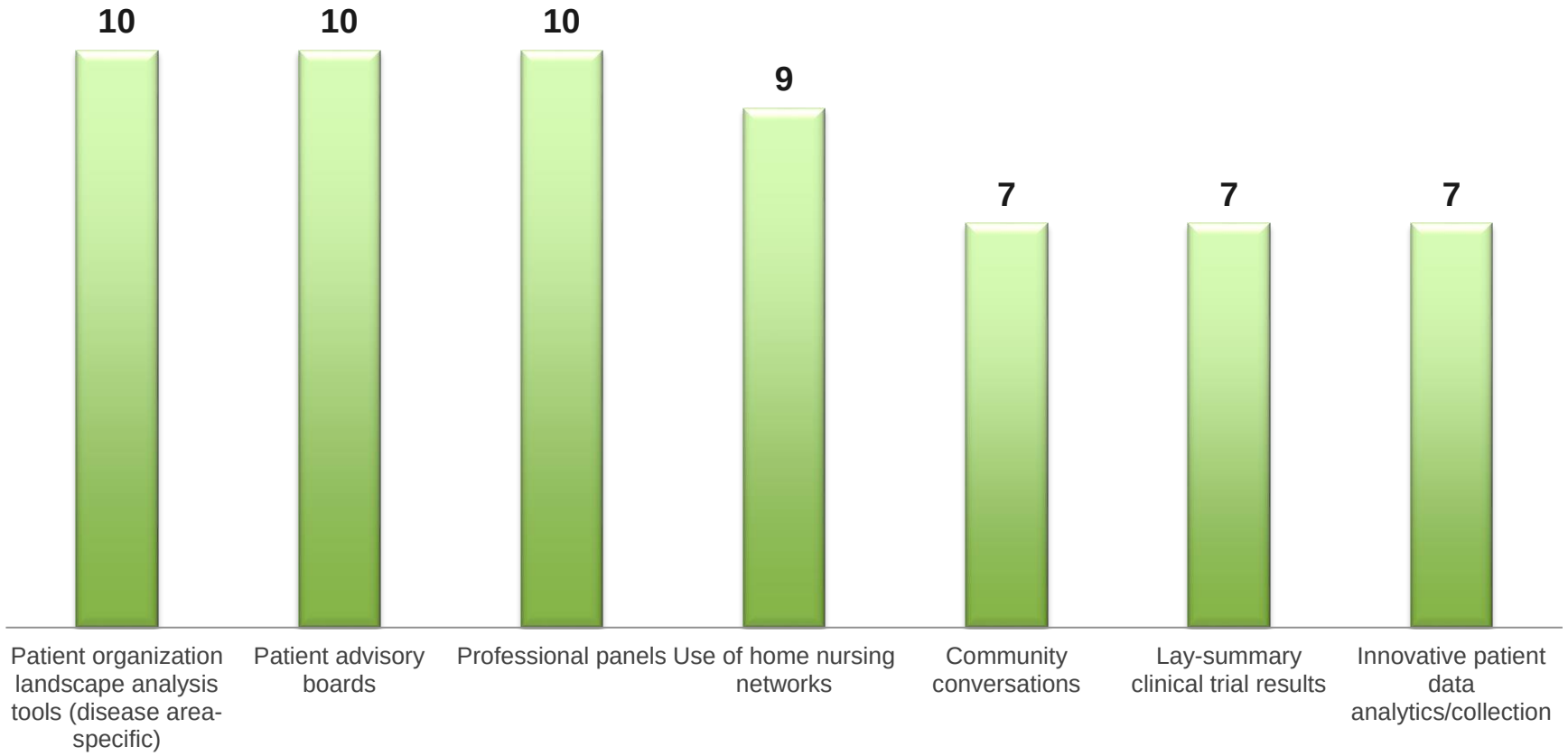
Patient-Centric Initiative Adoption

- Most widely adopted (implemented and piloted) initiatives are:
  - Patient advisory boards (17/22 companies)
  - Professional panels (16/22)
  - Lay-language clinical trial results summaries (13/22)
  - Assessment of patient organization landscape (10/22)
  - Use of home nursing networks (9/22)
- Top planned initiatives are:
  - eConsent (11/22)
  - Adaptive trial designs and adaptive licensing (10/22)
  - Establishing patient communities (during and after clinical trials) (10/22)
- Overall, there are more organizational patient-centric activities in the planning stages than those being implemented or piloted.

Data and analysis provided by Tufts CSDD

Patient-Centric Initiatives - Implemented

The most implemented initiatives were patient organization landscape analysis tools, patient advisory boards, and professional panels.

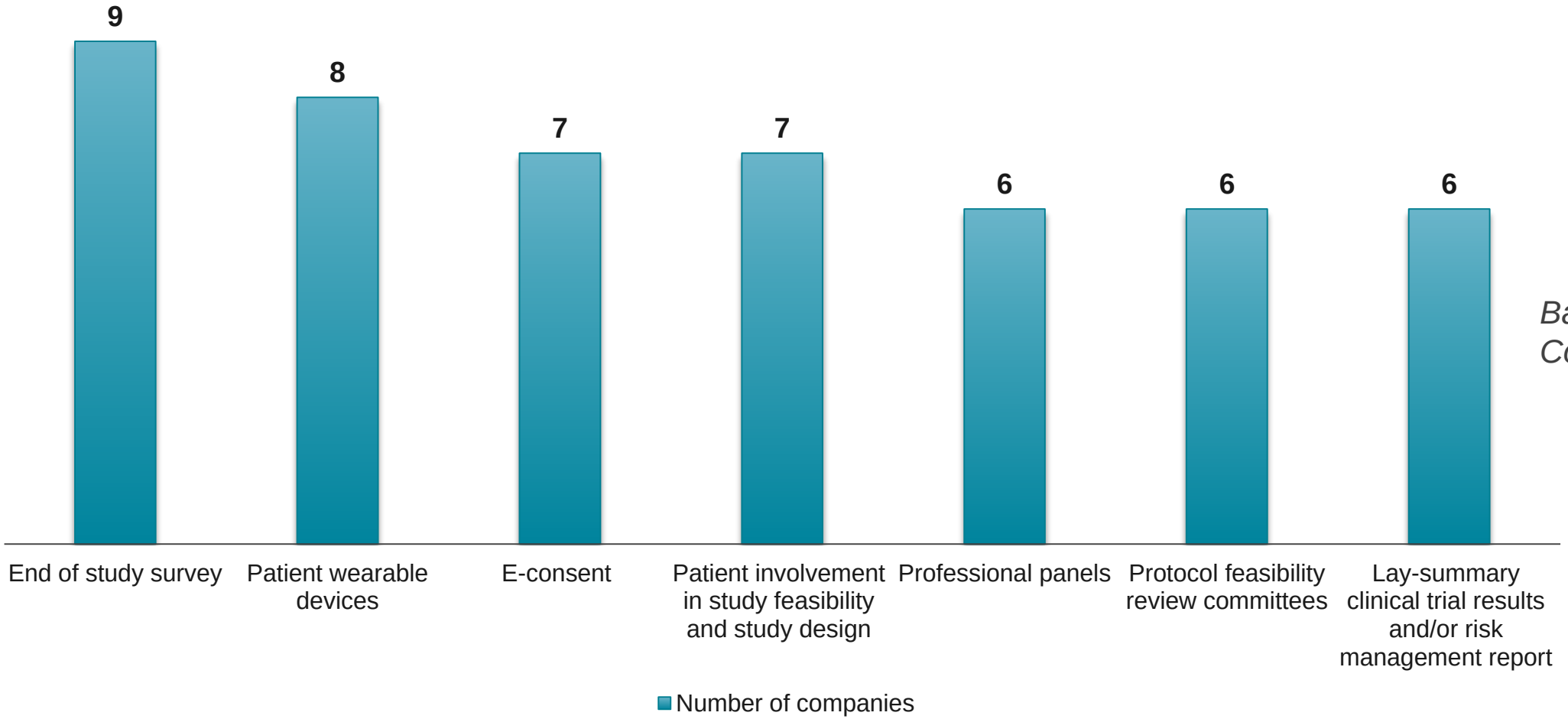


Base: 22 Companies

Data and analysis provided by Tufts CSDD

Patient-Centric Initiatives - Piloted

The top piloted initiative was an end of study survey.

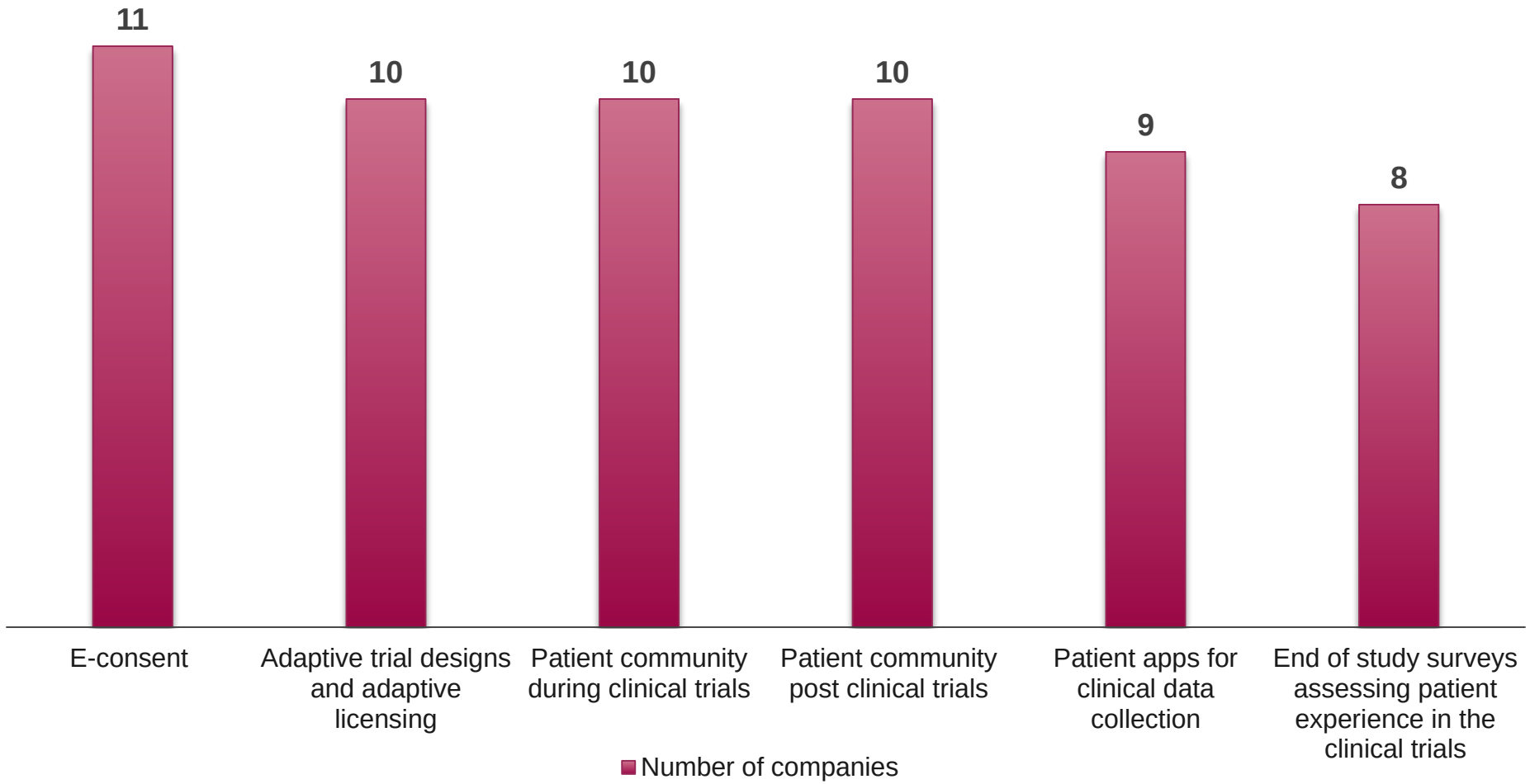


Base: 22 Companies

Data and analysis provided by Tufts CSDD

Patient-Centric Initiatives - Planned

The top planned initiative was e-consent.

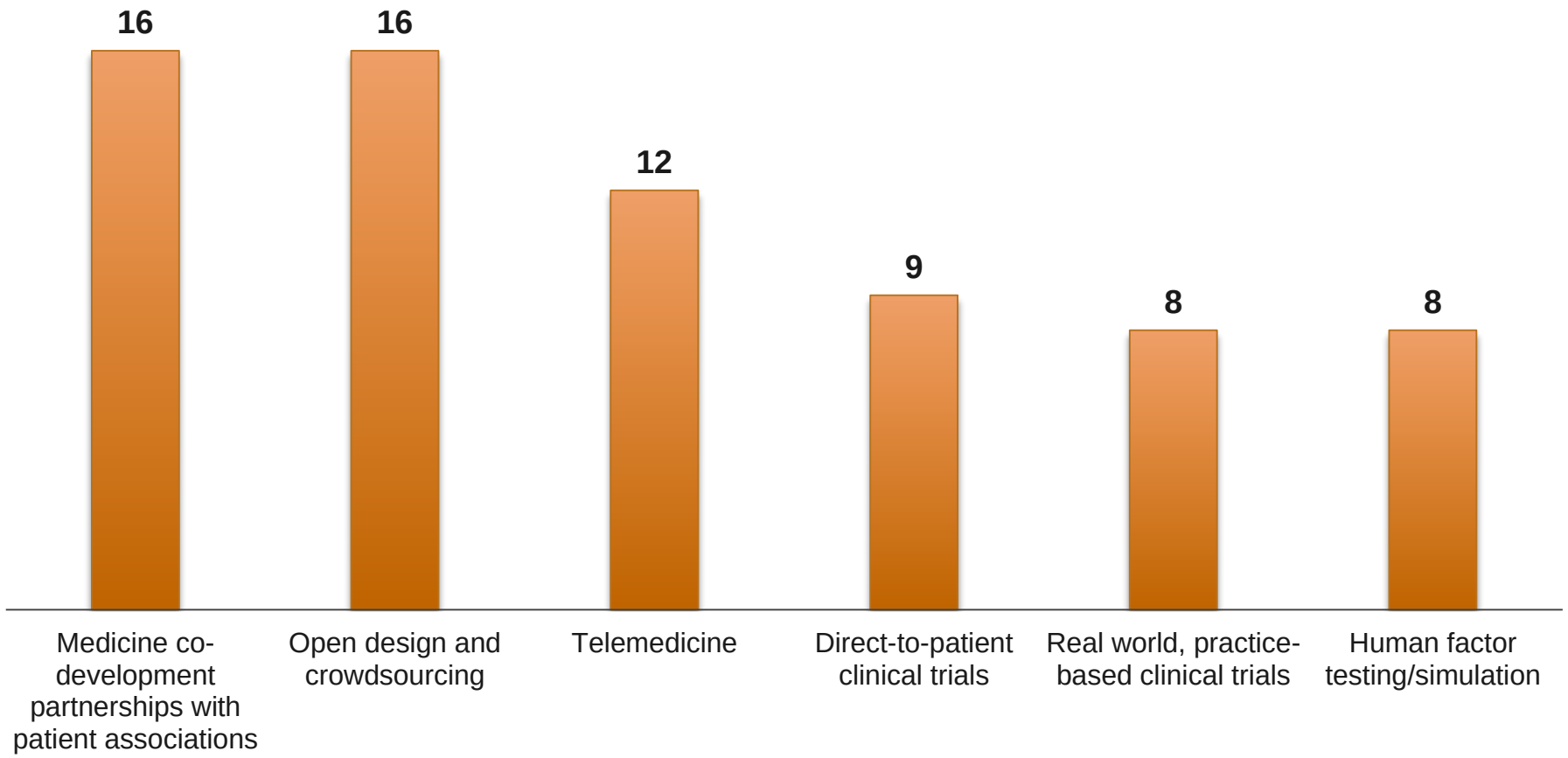


Base: 22 Companies

Data and analysis provided by Tufts CSDD

Patient-Centric Initiatives – Not Considered

The top initiatives companies are not considering are the medicine co-development partnerships with patient associations and open design and crowdsourcing.



Base: 22 Companies

Data and analysis provided by Tufts CSDD

Key Insights

- The primary barriers to adoption are the lack of:
  - internal company buy-in (6 of 22 companies)
  - authority to implement them (5 of 22 companies)

- Others barriers include (perceived) lack of sponsor readiness, risk tolerance, staff, time, and budget
  - 13 out of 20 companies responded there is **an organizational budget** assigned for patient engagement activities.
  - 6 out of 20 companies responded they **did not have a budget** for these activities.
  - 1 company did not respond.

PE Management Models

- Wide variation in approaches observed
- Most prevalent model: Centralized, dedicated function
- Responsibilities include:
  - Facilitate cultural change within organization
  - Build policies, guidelines, processes and tools
  - Share effective practices across the company
  - Advance more systematic patient centricity company-wide
  - Facilitate and coordinate implementation
  - Manage internal alignment of patient engagement and advocacy outreach efforts
- Note – function does not implement PCIs and does not have funding or approval authority for PCIs

Comments

- Most companies with a dedicated patient engagement role say it has **had an impact on the business** by translating to key operational changes
- However, most companies **do not have or use metrics** to **measure the impact of the role**

PE Management Models *(continued)*

Decentralized Patient Engagement functions:

- Leadership teams comprised of representatives from multiple functions
- Teams are not centralized but have visibility to and strong support from senior leadership
- Scan the company landscape, pilot patient engagement approaches, scale up successful approaches, establish support for operationalization, and disseminate appropriate practices company-wide
- Patient engagement efforts are initiated in the functional units throughout the company

Patient Engagement as “Strategic Core”:

- Expectation for patient engagement to take place is core to company strategy
- No single group is *responsible* for overseeing or supporting PE efforts
- Leadership ensures that PE is part of all strategic planning via policies, processes, and oversight
- PE activities take place within multiple functions throughout the company

Organizational Structure & Functions for Patient Engagement

Companies with Dedicated PE Role	Large (n = 4)	Mid-sized (n = 3)	Small (n = 3)
Leadership Structures – PE Role Via:			
C-Level Patient Office	2	1	---
Collaborative Leadership Teams	2		---
Pt Advocacy Team: Internal & External Roles		1	---
Small Internal Coordinating Team		1	---
Small Central Team to Coordinate & Oversee			3
Multiple Staff Members on Team	4	3	2
Bridge R&D and Commercial	4	3	3
Global Focus	2	2	3
Dedicated PE Budget	4	3	2
Adequate Budget for PE Objectives	3	3	1

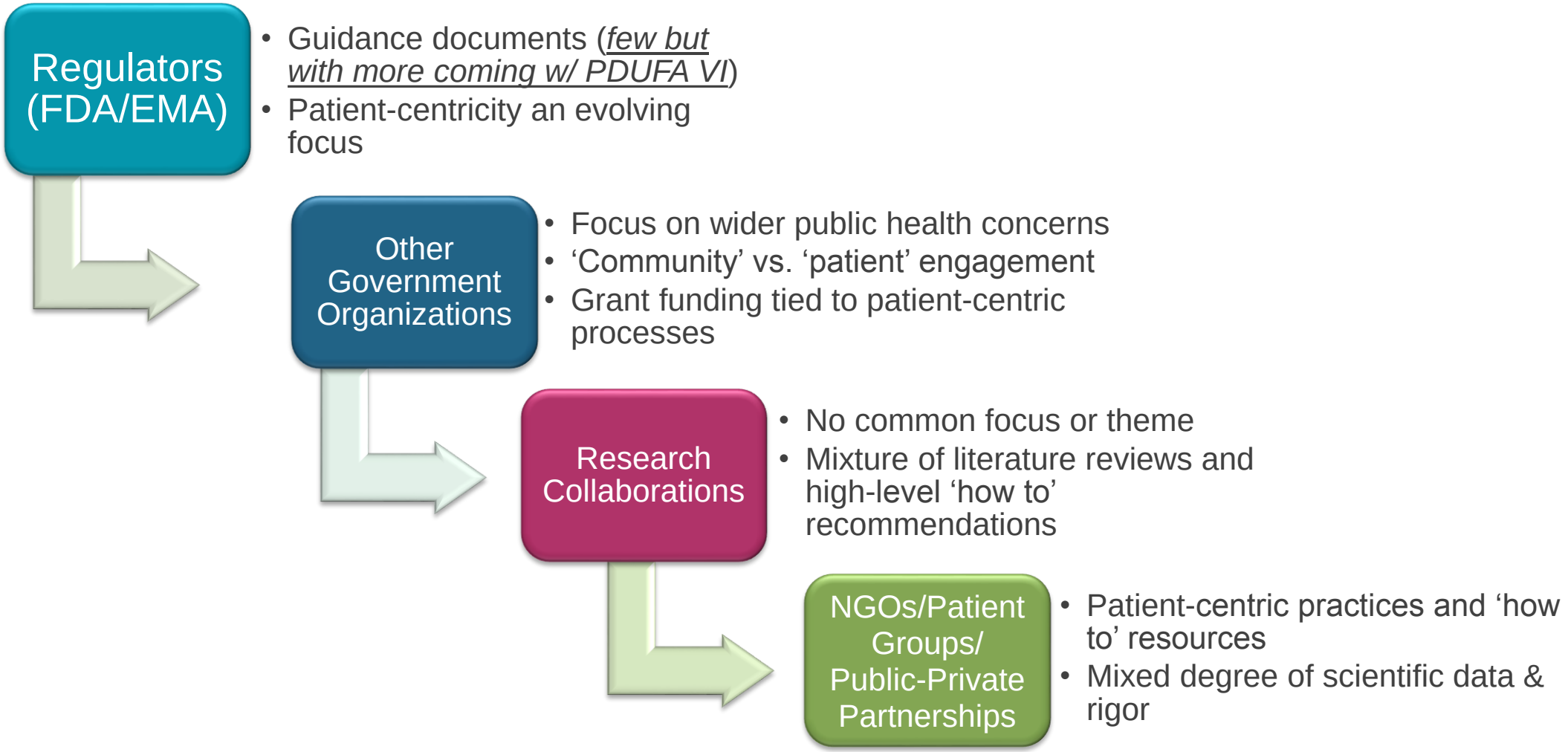
Organizational Structure & Functions for Patient Engagement

Companies with NO Dedicated PE Role	Large Companies (n = 3)	Mid-sized Companies (n = 3)	Small Companies (n=0)
PE Taking Place in Multiple Functional Areas:			
Clinical Development /Operations	3	2	
Patient Advocacy	3	2	
Medical Affairs	3	1	
Government/External Relations	2	0	
Corporate Affairs	2	1	
Communication Among Functions	3	3	
Communications Bridge R&D & Commercial	3	3	
Global Focus	1	0	
Dedicated PE Budget	1	0	
Adequate Budget for PE Objectives	0	1	

Guidance Landscape

- **Regulators are embracing patient-centricity** and plan to develop more guidance for industry in the future (e.g., PDUFA VI), but little is available now.
- Existing **regulatory guidance is specific to what can be measured**, e.g., patient-reported outcomes (PROs).
- **No single guidance document** or resource covers all aspects of patient-centric drug development, but a compilation of all existing tools comes close.
- **Multiple organizations are working on developing tools**, generally from one of two perspectives: data-driven and people-driven.
- **Toolkits and other resources more often deal with the less scientific** aspect of patient-centric drug development (e.g., communications, training, relationship building, trial participant interactions).

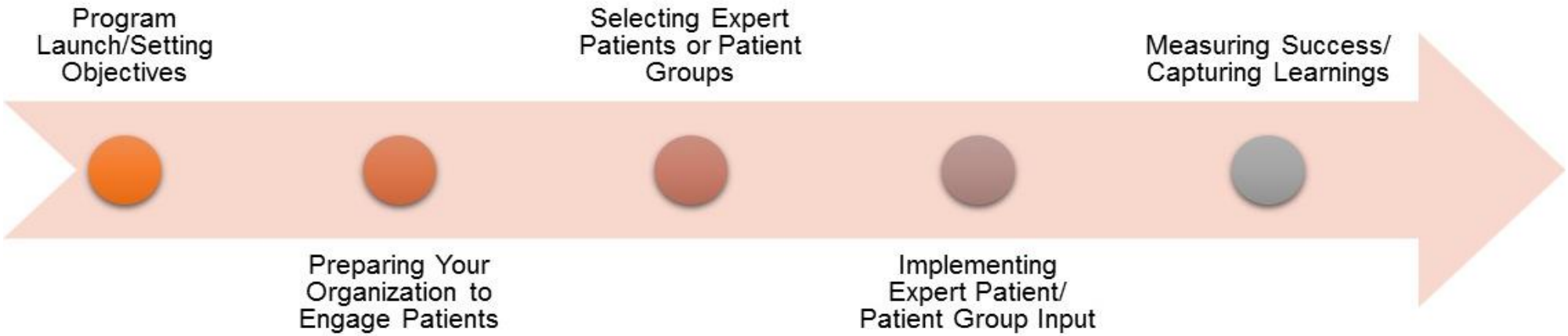
Evolving Data Collection for Guidances & Frameworks



Considerations Guide & Practical “How to”

Developed a ‘Considerations Guide’

- Designed to facilitate the development of a customized patient-centric initiative
- Collects and directs users to various resources currently available



How We Think @ www.DIAglobal.org

Visual Model of Patient Engagement

JOIN THE PATIENT ENGAGEMENT CONVERSATION

DIA Members interact in this exclusive online forum, hosting engaging discussions, webinars and connecting with Patient Engagement stakeholders globally. Already a DIA Member? Join the DIA Patient Engagement Community.

Access these Patient Engagement Resources at www.diaglobal.org:

Download:

- Visual model of Patient Engagement
- Research Summary
- PCI Considerations Guide

Join the conversation on the DIA Patient Engagement Community

Patient Engagement on the Agenda: Global Annual Meeting

Full Track of 14 Patient Engagement Sessions, including:

Monday June 19:

8:00 AM **Capturing the Value of Patient Engagement: State of the Art**

10:45 AM **Patient Engagement: 4 W's and an H**

Tuesday June 20:

10:30 AM **Walking the Walk in Patient Focused Medicines Development: What Have We Learned?**

2:00 PM **Defining the Science of Patient Input to Enhance Drug Development & Approval: Regulatory Perspectives**

4:00 PM **Defining the Science of Patient Input to Enhance Drug Development & Approval: The Tools**

Visit www.diaglobal.org/flagship/dia-2017 for more information

Fall 2017 Workshop: Patient Engagement Metrics – How Can We Capture Value?

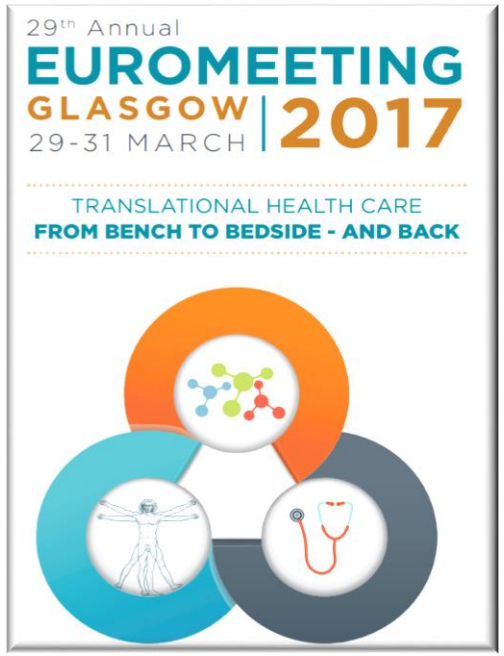
Visit www.diaglobal.org for information, details coming this Spring!

Patient Engagement on the Agenda: EuroMeeting

Roundtable with IMI:

The discussion will aim to demonstrate the **value of patient involvement in medicines R&D**, and will address the following questions and issues:

- What does **patient centricity** mean to different stakeholders?
- Why do we need patients to be engaged at an **early stage of medicines development**?
- What are the **lessons learned** from existing cases?
- What are the **challenges** in early patient involvement?
- How should patients be engaged for the **impact to be real and meaningful**?



Visit http://www.diaglobal.org/en/flagship/euromeeting for more information

Invitation to Join the Next Phase of Research

DIA and Tufts CSDD are planning the next phase of research:

- **Objectives**: Development of best practice recommendations and standardized metrics definition and usage; application and refinement of tools and resources; ongoing compilation of ROE impact case studies
- To be conducted Q2 2017 through Q1 2018
- Working group of sponsor and CRO companies will meet to review and discuss patient engagement experiences, challenges and insights
- Facilitated roundtable meetings with guest speakers from public and private sectors

Thank You!

We've made a significant contribution to this important topic and look forward to continuing this work with your support.

For expressions of interest and recommendations for follow-on research, please contact:
Elizabeth.Lincoln@DIAGlobal.org

Want more on Patient Engagement news, initiatives, and follow-on work? **Visit "How We Think" for more**.