



AGENCY FOR  
**CLINICAL  
INNOVATION**

# Disruption through high level research

Bridging paediatric and adult health services research?

14 May 2018

**Jean-Frederic Levesque MD PhD**

Chief Executive – Agency for Clinical Innovation

Conjoint Professor – Centre for Primary Health Care and Equity, UNSW

# disruptive

*adjective* • UK  /dɪsˈrʌp.tɪv/ US  /dɪsˈrʌp.tɪv/

★  **causing trouble and therefore stopping something from continuing as usual:**

*His teacher described him as a noisy, disruptive **influence** in class.*

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- ★  **causing trouble and therefore stopping something from continuing as usual:**

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- ★ SPECIALIZED business **changing the traditional way that an industry operates, especially in a new and effective way:**

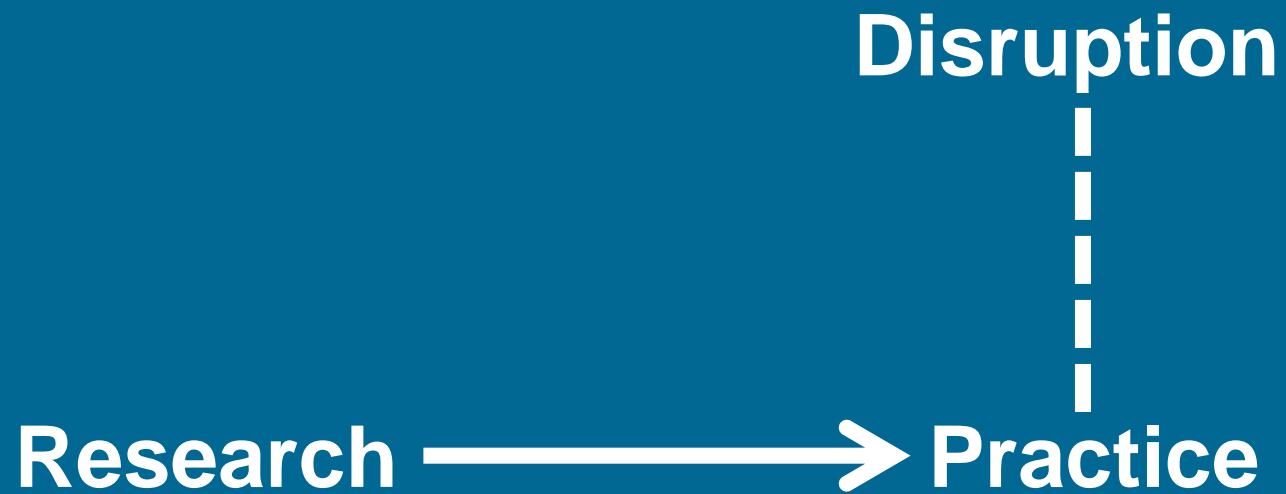
*disruptive technologies*

The aim of this presentation is to show examples of disruptive research that have parallels in adult and paediatric populations.



- 1 Disruptive research
- 2 Researching disruptions
- 3 Disrupting research
- 4 Research as a disruption

# 1 Disruptive research



# Clinical variation in outcomes of care for the elderly

Table 3  
Relationship of ED Bed Relative Occupancy Ratio to 30-day Outcomes Among 677,475 Patients Visiting 42 EDs in 2005

Outcomes by ED Bed Relative Occupancy Rate	n with outcome	% with outcome	Univariate models			Multivariable models*			
			OR	99% CI	p-value	OR	99% CI	p-value	Pseudo R <sup>2</sup>
Death (N = 677,475)	12,994	1.8	1.06	1.05–1.07	<0.001	1.03	1.02–1.04	<0.001	0.43
ED return visit among discharged patients (n = 577,696)	67,155	12.1	1.00	0.99–1.01	0.150	1.00	0.99–1.00	0.036	0.06
Admission at ED return visit (n = 67,155)	11,479	15.6	1.04	1.03–1.05	<0.001	1.03	1.01–1.04	<0.001	0.19

Random intercept is included to model the effect of ED.  
OR was computed for an increase of 10% in relative occupancy ratio.  
\*Multivariable: adjusted for patient baseline characteristics (age, sex, urban vs. rural residence, socioeconomic status, long-term care residence, hospital days, GP and specialist office or clinic visits, ED visits, multimorbidity, previous mental health diagnoses), index visit characteristics (diagnosis/es, weekend vs. weekday, and season), and the three composite ED measures (ED size/type, physician:patient ratio, and nurse:patient ratio). OR = odds ratio.

# Clinical variation in paediatric care

## Quality of Health Care for Children in Australia, 2012-2013

Jeffrey Braithwaite, PhD<sup>1</sup>; Peter D. Hibbert, BAppSci<sup>1,2,3</sup>; Adam Jaffe, MD<sup>4,5</sup>; Les White, DSc<sup>1,6,7</sup>; Christopher T. Cowell, MBBS<sup>8,9</sup>; Mark F. Harris, MD<sup>10</sup>; William B. Runciman, MD<sup>1,2,3</sup>; Andrew R. Hallahan, MBBS<sup>11</sup>; Gavin Wheaton, MBBS<sup>12</sup>; Helena M. Williams, MBBS<sup>13,14,15</sup>; Elisabeth Murphy, MPAeds<sup>16</sup>; Charlotte J. Molloy, BBehSc<sup>1,2</sup>; Louise K. Wiles, PhD<sup>1,2</sup>; Shanthi Ramanathan, PhD<sup>1,2</sup>; Gaston Arnolda, PhD<sup>1</sup>; Hsuen P. Ting, MSc<sup>1</sup>; Tamara D. Hooper, BSc<sup>1,2</sup>; Natalie Szabo, MA<sup>1,2</sup>; John G. Wakefield, MPH<sup>17</sup>; Clifford F. Hughes, DSc<sup>1,18</sup>; Annette Schmiede, BEc<sup>19</sup>; Chris Dalton, MPH<sup>19</sup>; Sarah Dalton, MAppMgt<sup>7,20,21</sup>; Joanna Holt, MHP<sup>1</sup>; Liam Donaldson, MD<sup>22,23</sup>; Ed Kelley, PhD<sup>23</sup>; Richard Lilford, DSc<sup>24</sup>; Peter Lachman, MD<sup>18</sup>; Stephen Muething, MD<sup>25</sup>

[» Author Affiliations](#)

JAMA. 2018;319(11):1113-1124. doi:10.1001/jama.2018.0162





# Identifying high users of services

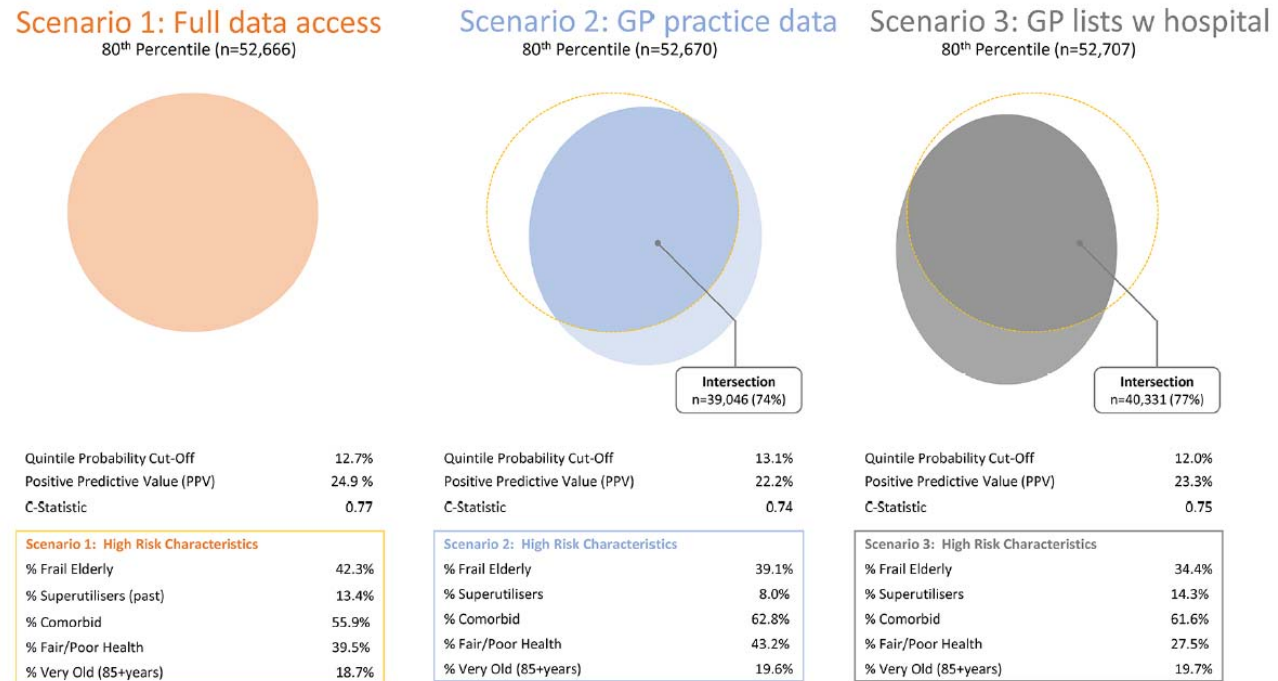


Figure 1 Comparison of high-risk quintiles from the full, GP and hospital scenarios. GP, general practice.



(Johnson, Kaldor, Falster, Sutherland, Humphries, Jorm & Levesque 2017)

# High users of services in paediatric populations

## HealthcarePapers

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HealthcarePapers, 14(2) July 2014: 52-56.doi:10.12927/hcpap.2015.24110

Commentary

### **The Unseen High-Cost Users: Children and Youth with Mental Illness** <sup>P</sup>

Roger Chafe and Richard Audas

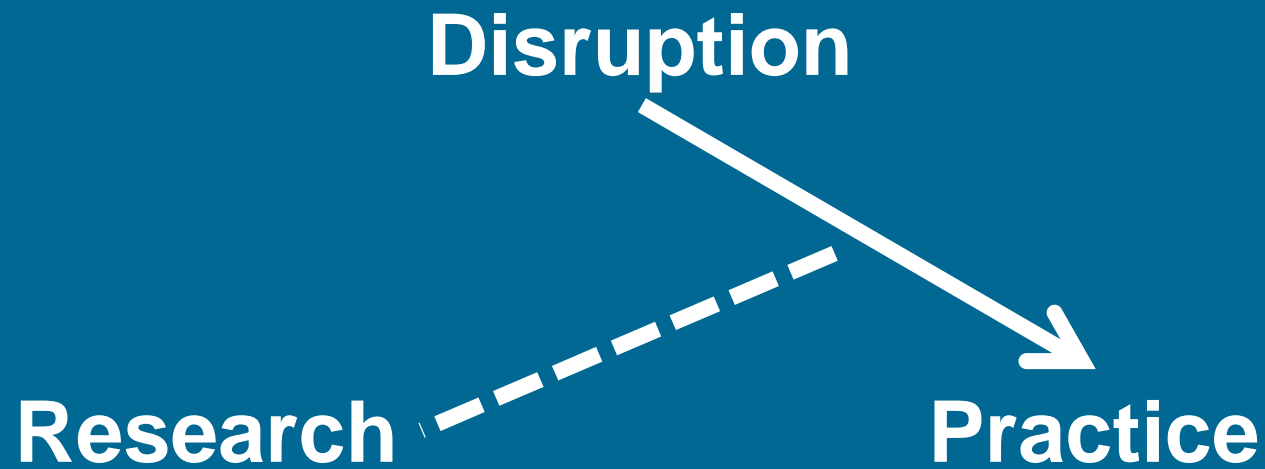


### **Abstract**

Often neglected from discussions of high-cost healthcare users are children and youth with mental health issues. But when considered from the perspective of all of the various public and community services they require, and their impact on families, these children should be considered in initiatives to improve care for frequent healthcare users. For children with mental illness, because of the fragmented services they receive, there are clear opportunities for gains in patient care through better clinical and social care integration, even without significant additional investments. A key barrier to improving care for these children and youth is better understanding their care pathways. We conclude by describing a new multidisciplinary research project, which is taking an inter-sectorial view of how youth and their families access mental health services across the four Atlantic Canadian provinces, to provide the knowledge basis to improve care for these vulnerable, high-cost patients.



## 2 Researching disruptions



# Reducing low-value procedures in older people

a. Arthroscopy rate by district of residence, public hospital provision only, 2004-2015

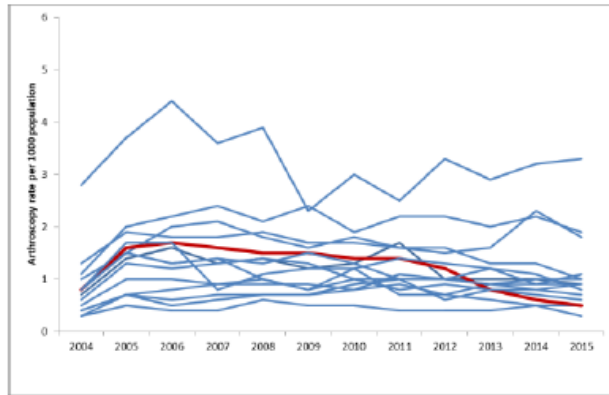


Figure legends:

- South Western Sydney
- Other districts



(Chen, Harris, Sutherland & Levesque, in press)

# Reducing low-value procedures in older people

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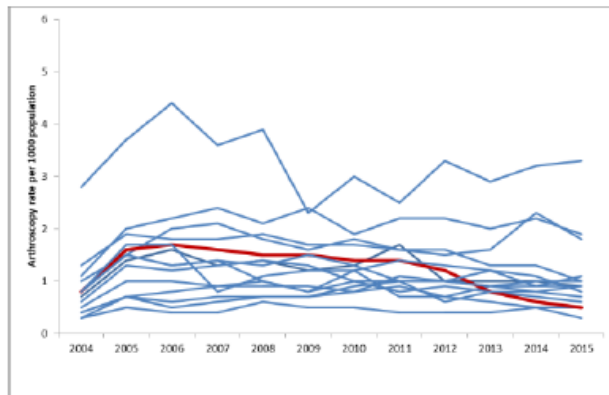
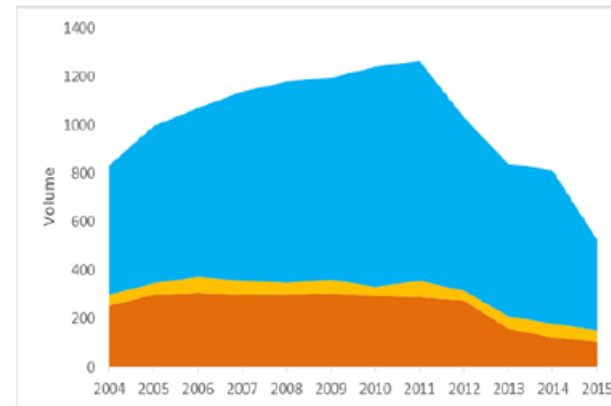


Figure legends:

- South Western Sydney
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b. Knee arthroscopies performed for SWSLHD residents (Demand), 2004-2015



- Local : patients received surgery at public hospitals at their residential LHD
- Inflow : patients lived in other LHDs received surgery in this LHD's public hospitals
- Outflow : patients received surgery in other LHD's public hospitals
- Private : patients received surgery in a private hospital



(Chen, Harris, Sutherland & Levesque, in press)

# Disinvesting in care for children

Pediatrics  
February 2018, VOLUME 141 / ISSUE 2  
From the American Academy of Pediatrics  
Quality Report

## Multisite Emergency Department Inpatient Collaborative to Reduce Unnecessary Bronchiolitis Care

Grant M. Mussman, Michele Lossius, Faiza Wasif, Jeffrey Bennett, Kristin A. Shadman, Susan C. Walley, Lauren Destino, Elizabeth Nichols, Shawn L. Ralston

**RESULTS:** Thirty-five hospitals with 5078 ED patients and 4389 IPs participated. Use of bronchodilators demonstrated special cause for the ED (mean centerline shift: 37.1%–24.5%, benchmark 5.8%) and IP (28.4%–17.7%, benchmark 9.1%). Project mean ED viral testing decreased from 42.6% to 25.4% after revealing special cause with a 3.9% benchmark, whereas chest radiography (30.9%), antibiotic use (6.2%), and steroid use (7.6%) in the ED units did not change. IP steroid use decreased from 7.2% to 4.0% after special cause with 0.0% as the benchmark. Within-site ED and IP performance was modestly correlated.



# New models of primary care for type II diabetes

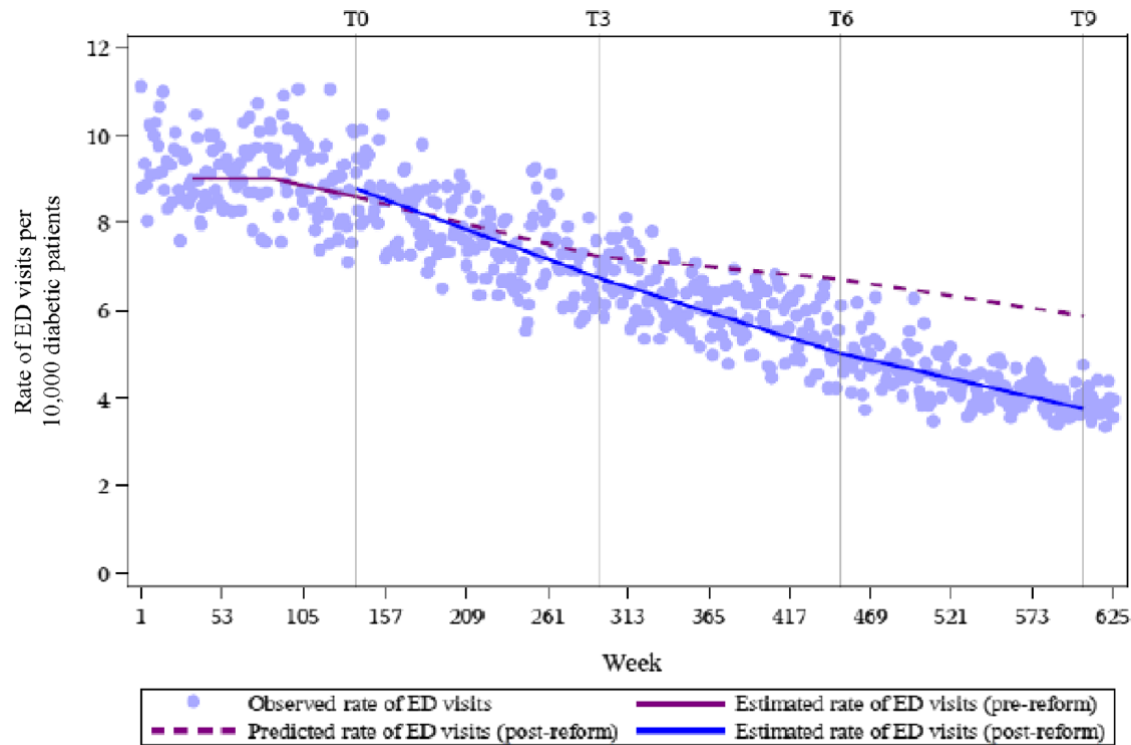


Fig. 2 Weekly time series of the rate of avoidable ED visits among diabetic patients in Quebec in urban regions, 2000/01 to 2011/12



(Carter, Quesnel-Vallee, Plante, Gamache & Levesque, 2016)

# New models of primary care for children

## Improved Outcomes Associated With Medical Home Implementation in Pediatric Primary Care



**WHAT'S KNOWN ON THIS SUBJECT:** Specific attributes of a medical home improve the quality and efficiency of care, and there are demonstrated benefits in relation to some preventive care outcomes (immunizations) and with respect to specific conditions (asthma, low birth weight).



**WHAT THIS STUDY ADDS:** Increasing medical homeness across multiple attributes results in reduced hospitalization and emergency visits for children with several chronic conditions.

### abstract

**OBJECTIVE:** The medical home model with its emphasis on planned care, care coordination, family-centered approaches, and quality provides an attractive concept construct for primary care redesign. Studies of medical home components have shown increased quality and reduced costs, but the medical home model as a whole has not been

**CONTRIBUTORS:** W. Carl Cooley, MD,<sup>a,b</sup> Jeanne W. McAllister, BSN, MS, MHA,<sup>a</sup> Kathleen Sherrieb, DrPH, MS,<sup>c,d</sup> and Karen Kuhlthau, PhD<sup>e,f</sup>

<sup>a</sup>Center for Medical Home Improvement, Crotched Mountain Foundation, Greenfield, New Hampshire; Departments of <sup>b</sup>Pediatrics and <sup>c</sup>Psychiatry, Dartmouth Medical School, Hanover, New Hampshire; <sup>d</sup>Department of Veterans Affairs, National Center for Posttraumatic Stress Disorder, White River Junction, Vermont; <sup>e</sup>Center for Child and Adolescent Health Policy, Massachusetts General Hospital for Children, Boston, Massachusetts; <sup>f</sup>Department of Pediatrics, Harvard Medical School, Boston, Massachusetts

#### KEY WORDS

medical home, children with special health care needs, chronic illness, primary care, utilization of health care services, outcomes

#### ABBREVIATIONS

MHI—Medical Home Index

ADHD—attention-deficit/hyperactivity disorder

[www.pediatrics.org/cgi/doi/10.1542/peds.2008-2600](http://www.pediatrics.org/cgi/doi/10.1542/peds.2008-2600)

doi:10.1542/peds.2008-2600





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## Disrupting research

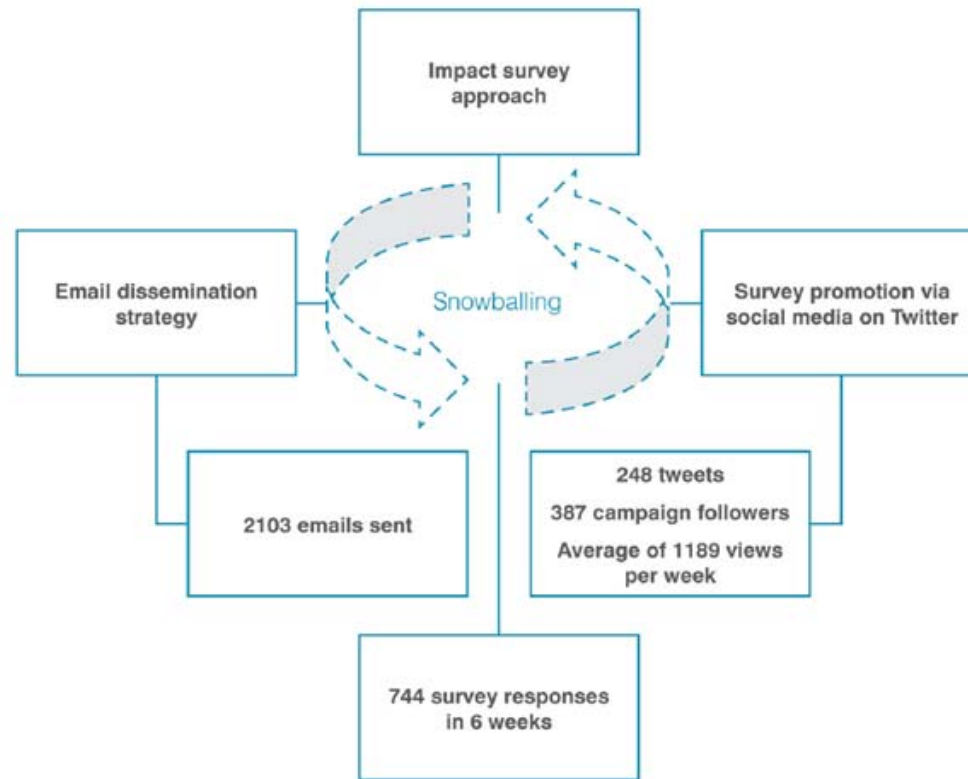
**Disruption**



**Research**  **Practice**



# Crowd-sourcing research methodology



(Richard, Furler, Densley, Haggerty, Russell, Levesque & Gunn 2016)

# Web-based patient-reported measures

Haverman *et al. BMC Pediatrics* 2011, **11**:3  
<http://www.biomedcentral.com/1471-2431/11/3>



**TECHNICAL ADVANCE**

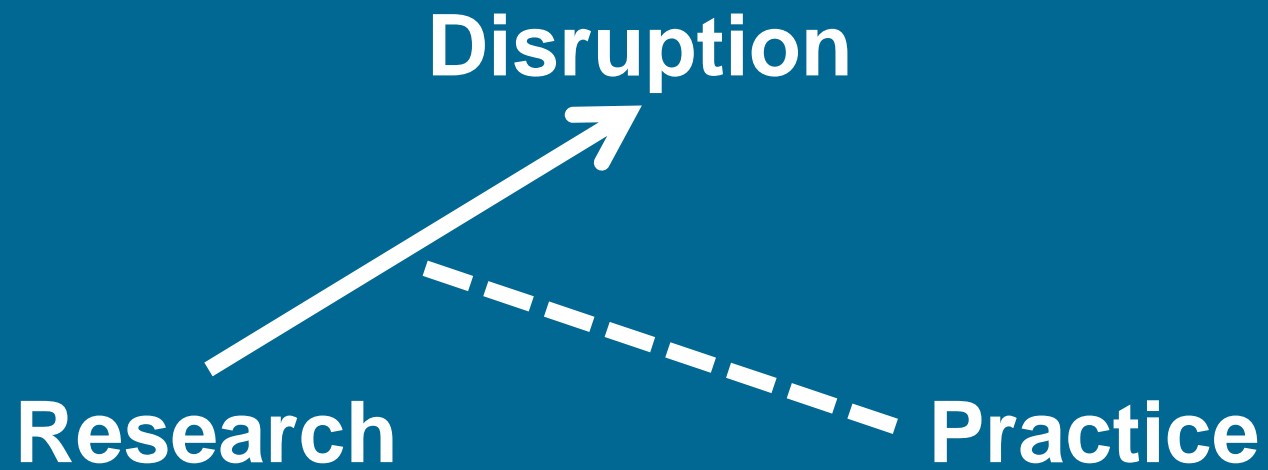
**Open Access**

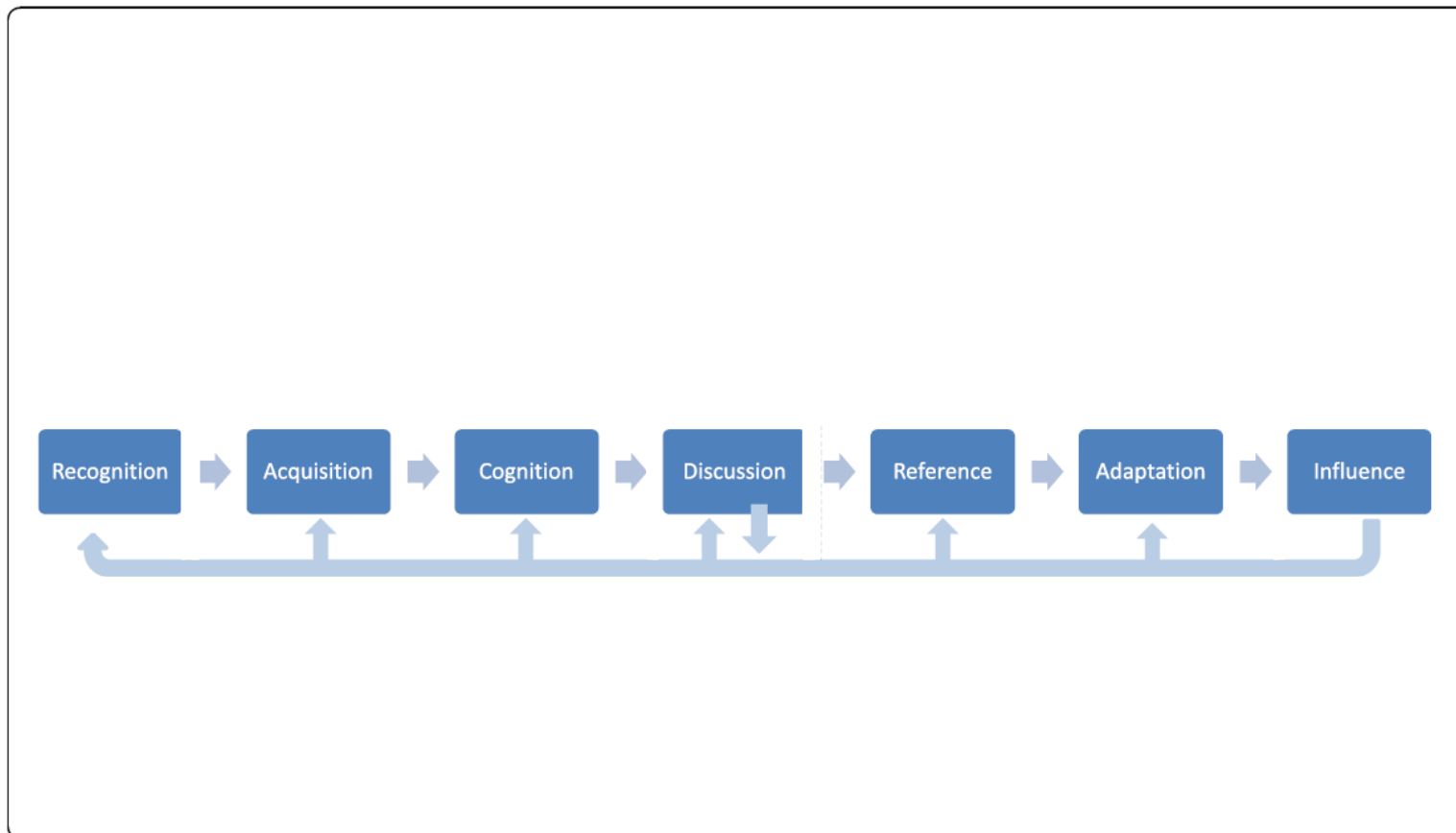
## Monitoring health-related quality of life in paediatric practice: development of an innovative web-based application

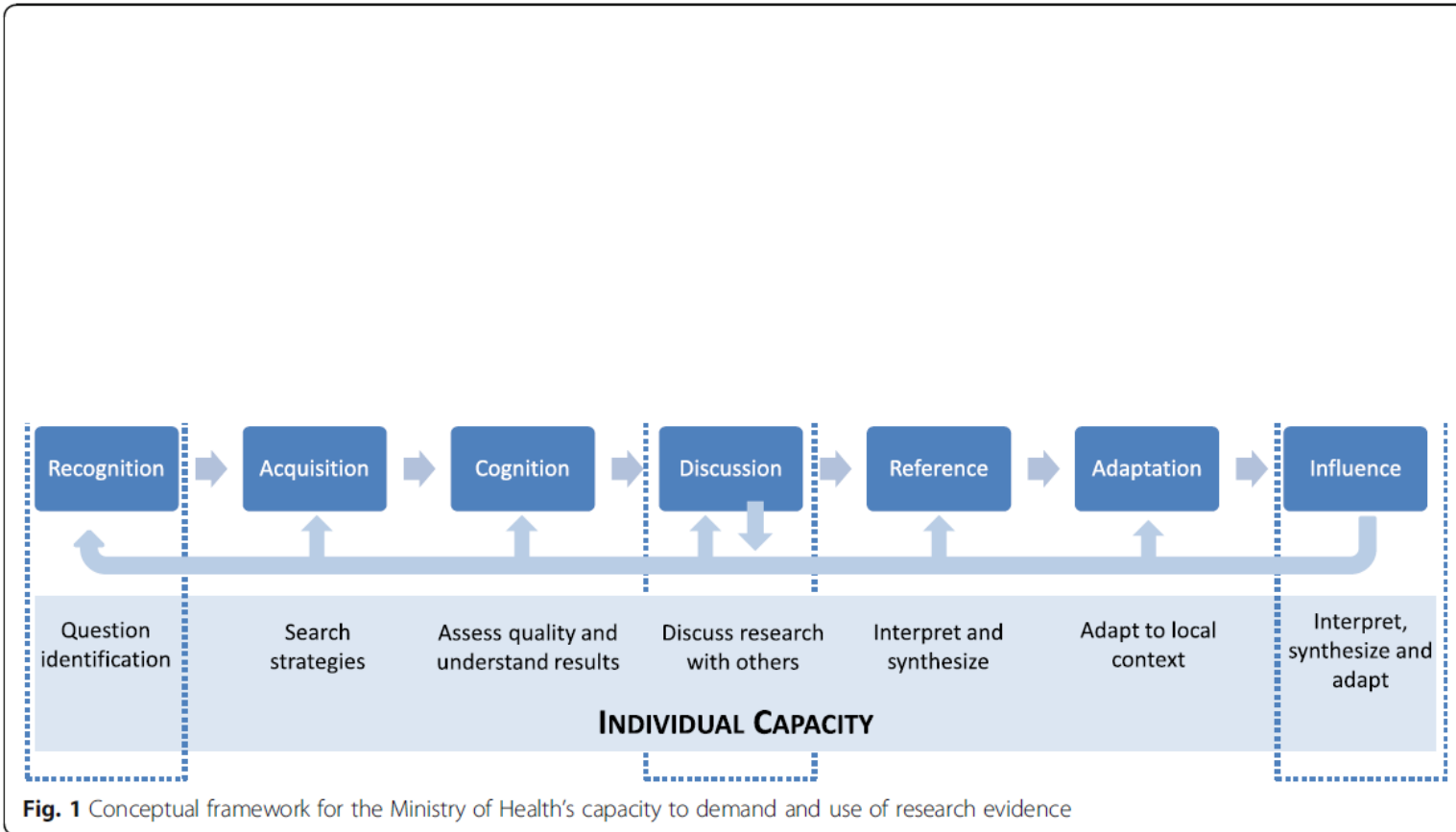
Lotte Haverman<sup>1\*</sup>, Vivian Engelen<sup>1</sup>, Marion AJ van Rossum<sup>2,3</sup>, Hugo SA Heymans<sup>2</sup>, Martha A Grootenhuus<sup>1</sup>

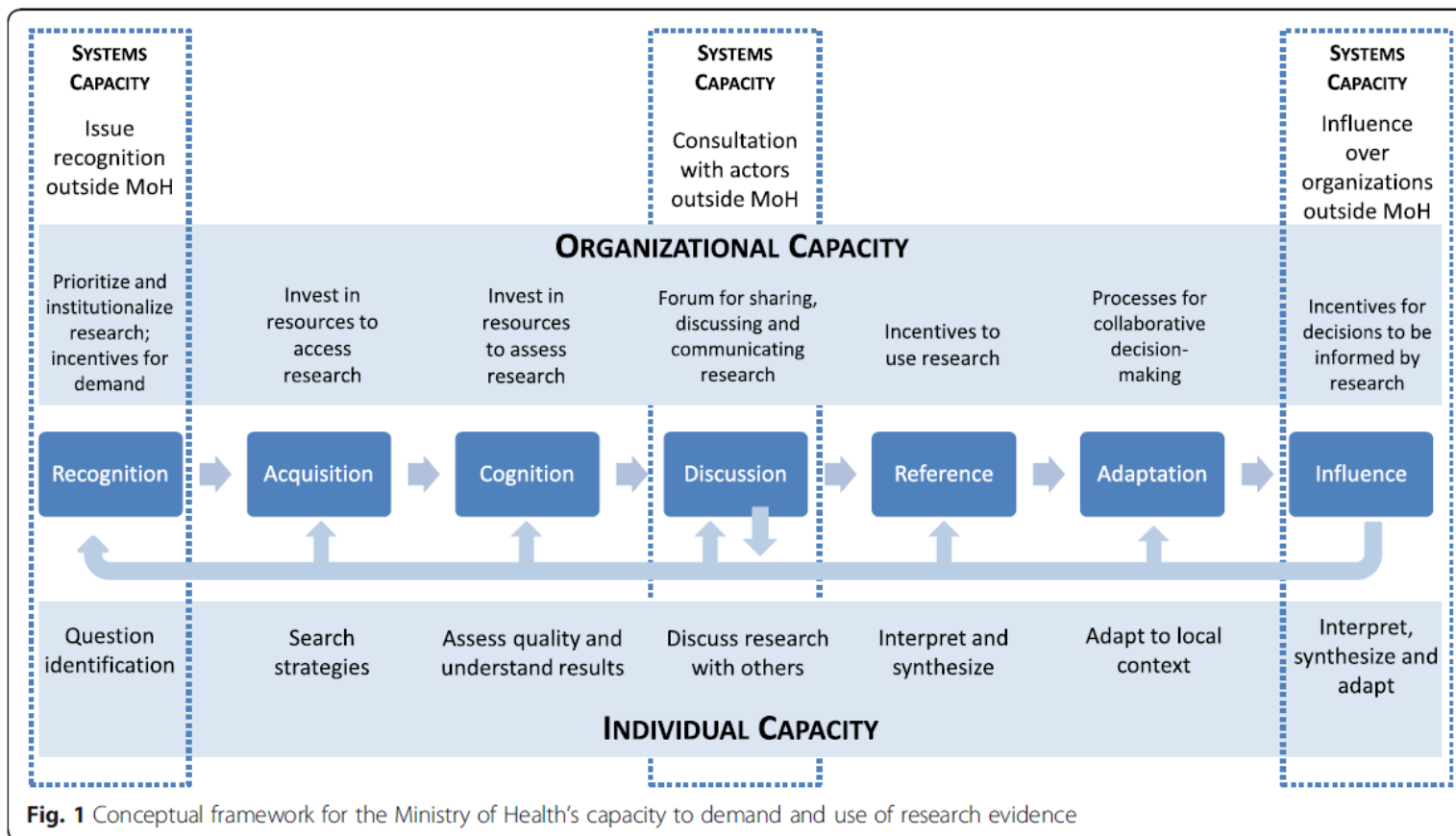


## 4 Research as a disruption









Disruption in research can be seen through multiple perspectives.

Research can be disruptive, be about disruption, be disrupted and be about disrupting.





There are parallels between adult and paediatric disruptions that relate to high users of services, clinical variation of care, new models of service delivery.



Level 4, 67 Albert Avenue  
Chatswood NSW 2067

PO Box 699  
Chatswood NSW 2057

T + 61 2 9464 4666  
F + 61 2 9464 4728

[aci-info@health.nsw.gov.au](mailto:aci-info@health.nsw.gov.au)  
[www.aci.health.nsw.gov.au](http://www.aci.health.nsw.gov.au)

**Thank you**

