Participatory mobile health (mHealth)

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Enabled by >6 x 10^9 mobile phone users, increasingly with: GPS, imagers, touch screens, Internet, app stores

Motivated by 6 x 10^9 people on planet earth, their health needs, and economic realities
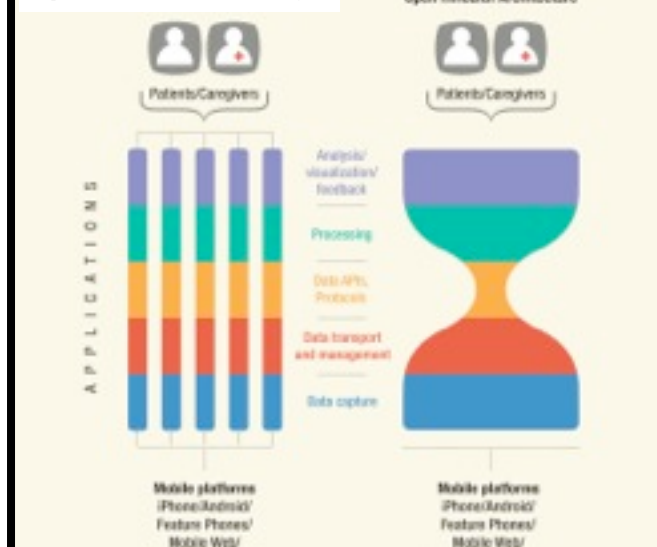

ubifit UW/Intel

moodphone (TM) Intel

welldoc (TM)   The Eatery (TM)   Tonic-app (TM)
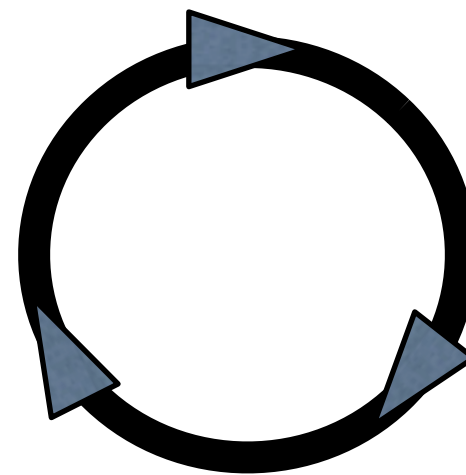
openmhealth.org

Transform previously unmeasured behaviors and practices into personalized, evidence-based, and evidence-producing care
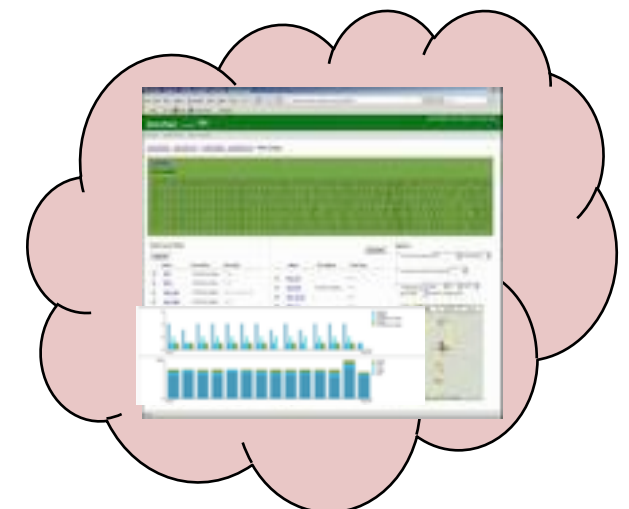

Photo: Marshall Astor, WWW

symptoms, side-effects, outcome measures, actions, activities, exposures..

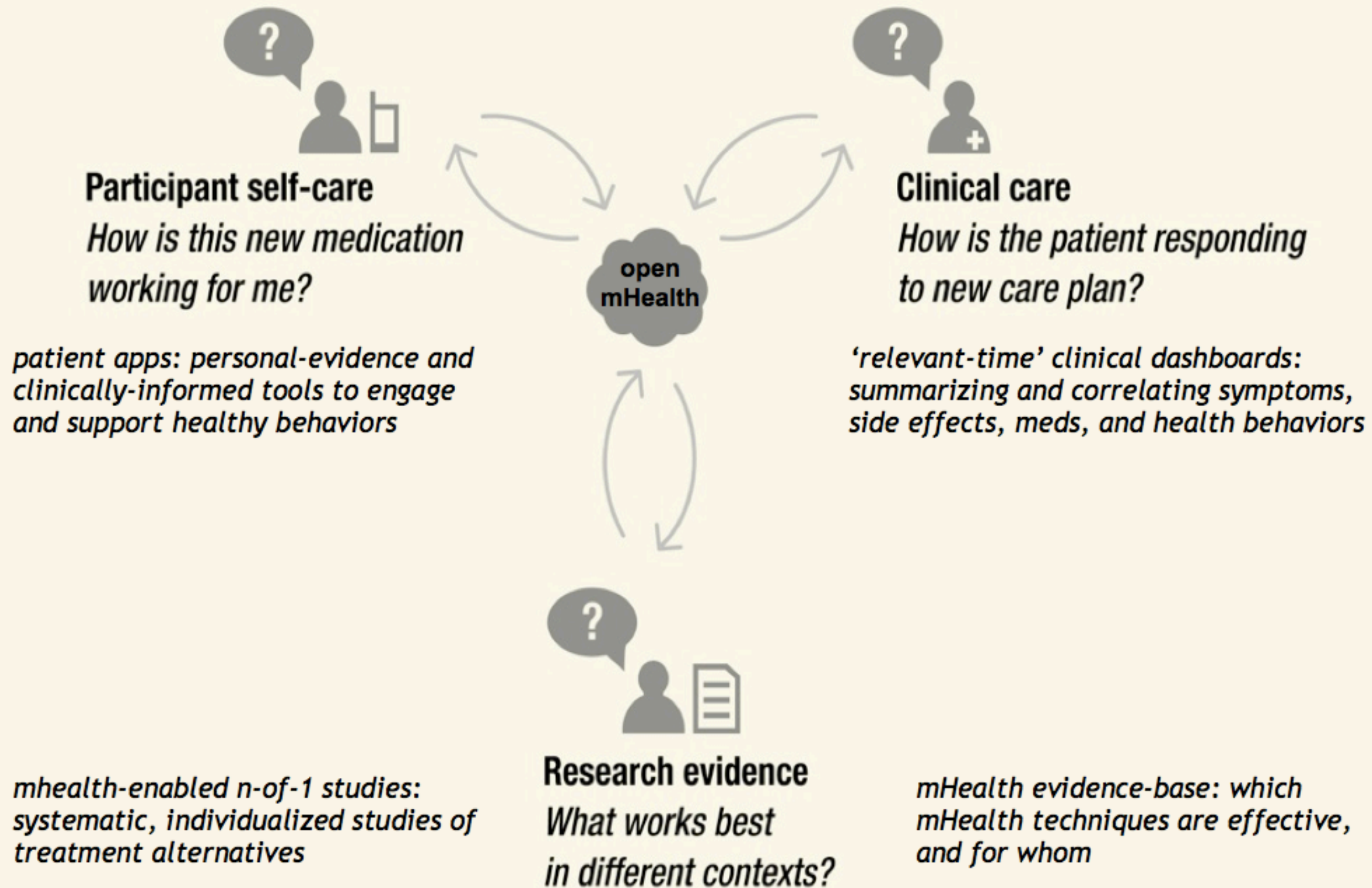*capture/record activity, mobility, self-reports, tool use, "digital exhaust"*

visualize, summarize, highlight; inform, advise, persuade

store, analyze, classify, fuse, mashup, filter, aggregate data

mHealth derived data serves 3 essential workflows

Participant self-care
How is this new medication working for me?

patient apps: personal-evidence and clinically-informed tools to engage and support healthy behaviors

open mHealth

Clinical care
How is the patient responding to new care plan?

'relevant-time' clinical dashboards: summarizing and correlating symptoms, side effects, meds, and health behaviors

mhealth-enabled n-of-1 studies: systematic, individualized studies of treatment alternatives

Research evidence
What works best in different contexts?

mHealth evidence-base: which mHealth techniques are effective, and for whom

Technical Challenges

- **Sensemaking**: analysis, presentation, visualization, for self, clinician, researcher

- **User modeling** for activity classification, context, triggers

- **User engagement**/experience: motivate sustainable user participation with game mechanics, adaptive interfaces

- **Resource management**, efficiency (enable full-day phone operation with background activity and data capture)

- **Selective sharing** of these very telling traces, usable privacy tools, alternative market models

- **System architecture**, open systems and communities

Bigger picture--*broadband to the him and her*

Use cases...

- In addition to the usual:

  - telephony

  - tv/movies

  - browsing

  - games

- **Personal analytics, logistics, tools....beyond blogging**

  - transportation and other resources

  - interaction

  - health

Broadband to the him and her: requirements/challenges--needs

Requirements:

- Mobility
- Socially integrated
- **Privacy (selective sharing)**
- **Structured (dynamic) Content**

Challenges:

- Capture, transport, storage ($)
- **Sense-making methods/tools**
- **Authoring content**

Investment needs:

- Infrastructure: capital investment, policy to realize capture and transport
- Architecture (modularity, open systems): to support structured content and privacy
- R&D that supports co-innovation in processes and methods, not just technology: for sensemaking and authoring