LEVERAGING INNOVATIONS IN MOBILE TECHNOLOGY FOR DEEPER PATIENT INSIGHTS
Smartphone-enabled MR + mHealth Biometric data = Deeper insights
Mobile Health (mHealth) goes way beyond activity trackers
Finally we can collect accurate biometric data without reliance on manual input
Passive Data Collection Supports Active Data Collection

Passive, biometric data gets us the WHAT.

Active data uncovers the WHY!

- Ask less questions
- More accurate data

TRUE HOLISTIC View of Consumer

SMART ANALYSIS

Active Data
- Mobile patient diaries
- Surveys

Passive Data Collection
- Biometric data from mHealth devices & apps
How can we conduct these types of studies?

Online Platforms

Mobile Survey App
Withings partnership
Withings Partnership

+ Leading mHealth device/app manufacturer
+ Recruiting, surveying and collecting biometric data from current Withings user base
Conducting Smoking Cessation Study in EU Using Activity & BMI Data Plus Surveys

Leveraging Innovations in Mobile Technology for Deeper Patient Insights
Pilot Study First Results: Stress

**SMOKERS**
- Over the past 2 days, would you say you felt stressed?
  - Most/All of the time: 24%
  - Sometimes: 13%
  - Never: 63%
- Average number of steps: 11,557
- Average sleep time: 6 hr 59 min

**TRYING TO QUIT**
- Over the past 2 days, would you say you felt stressed?
  - Most/All of the time: 17%
  - Sometimes: 16%
  - Never: 67%

**NON-SMOKERS**
- Over the past 2 days, would you say you felt stressed?
  - Most/All of the time: 40%
  - Sometimes: 11%
  - Never: 49%
- Average number of steps: 13,759
- Average sleep time: 7 hr 14 min

KANTAR HEALTH
Gender Differences Are Significant

Over the past 2 days, how did you feel when waking up in the morning?

**AVERAGE SLEEP DURATION**

<table>
<thead>
<tr>
<th></th>
<th>Not at all or somewhat rested</th>
<th>Well or perfectly rested</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SMOKERS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 hours 20 minutes</td>
<td>7 hours 12 minutes</td>
<td>7 hours 17 minutes</td>
</tr>
<tr>
<td>(n=35)</td>
<td>(n=18)</td>
<td>(n=27)</td>
</tr>
<tr>
<td><strong>TRYING TO QUIT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 hours 2 minutes</td>
<td>8 hours 5 minutes</td>
<td>6 hours 56 minutes</td>
</tr>
<tr>
<td>(n=32)</td>
<td>(n=10)</td>
<td>(n=16)</td>
</tr>
<tr>
<td><strong>NON SMOKERS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 hours 1 minute</td>
<td>7 hours 38 minutes</td>
<td>7 hours 42 minutes</td>
</tr>
<tr>
<td>(n=38)</td>
<td>(n=27)</td>
<td>(n=26)</td>
</tr>
</tbody>
</table>

In each group, women tend to sleep more than men and are not necessarily feeling better rested in the morning.
Mobile Survey Smartphone App

1. Conduct short surveys up to 15 minutes, optimum 5-10 minutes
2. Collect picture and video content
3. Passively collect biometric and activity data from a wide range of mHealth devices
Smartphone as ultimate source and repository for health & lifestyle data

Leveraging Innovations in Mobile Technology for Deeper Patient Insights
When Looking Into Consumer Experience – We Must Not Forget EMOTIONAL Component
Mobile Pain Diary: Clinical + Emotional Data Collection
Leveraging Innovations in Mobile Technology for Deeper Patient Insights

Demographics
- Female: n=35 (87.5%)

Age (Mean, SD): 33.6 ± 7.5

Treatments
- Other: n=10 (25.0%)
- Biologic: n=13 (32.5%)
- Opioid: n=16 (40.0%)
- Glucocorticoid: n=17 (42.5%)
- DMARD: n=22 (55.0%)
- NSAID: n=27 (67.5%)
- Diabetes
  - Psoriasis
  - Crohn’s Disease
  - Ankylosing Spondylitis: n=2 (5.0%)

Comorbidities
- Anxiety: n=29 (72.5%)
- Depression: n=25 (62.5%)
- Insomnia: n=33 (82.5%)
- Migraines: n=19 (47.5%)
- Fibromyalgia: n=13 (32.5%)
- Lupus: n=4 (10.0%)
Lifestyle Impact: Inability to conduct basic household chores
Emotional Connections: Bonding With Pets
Parenting with chronic pain
Taping up neck…in style
Husband falling asleep on wife during ER wait
Pain Survey Combined With Visuals PLUS Individual Mobility/Accelerometer Data
Leveraging data from connected glucose meters

+ Identify correlations between blood glucose levels, diet, fitness activity and mood
  - Does mood impact how patients manage their condition?
  - Glucose levels of patients who manage condition through diet & exercise vs. those with proper diet who DON’T exercise
Leveraging data from smart asthma inhalers

Capture time, frequency & location of usage while conducting short surveys
  Medication compliance & efficacy

Above average usage frequency can trigger surveys to ascertain cause
Despite recent examples, from market research perspective, still fairly new, uncharted territory

Challenges & Learning

+ Recruitment challenges
+ How much willing to share
+ Higher honoraria
+ Control for possible bias
THANK YOU!

Q&A