Opportunities for telemedicine in Southern Poland

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Current health expenditure
as a percentage of gross domestic product (GDP)
Current health expenditure as a percentage of gross domestic product (GDP) (total of public and private)

- Poland: 6.3%
- UK: 9.9%
- Germany: 11.2%

http://www.who.int/gho/health_financing/health_expenditure/en/
Density of physicians
(tot al number per 1000 population)

2,82
4,19
2,29

http://www.who.int/gho/health_workforce/physicians_density/en/
Density of physicians
(total number per 1000 population)

http://www.who.int/gho/health_workforce/physicians_density/en/
### Demographic time-bomb

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2050</th>
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<tbody>
<tr>
<td>Median of age</td>
<td>37.3 years</td>
<td>50.8 years</td>
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<tr>
<td>Percentage of population 65+</td>
<td>14.7%</td>
<td>30.2%</td>
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<tr>
<td>Percentage of population 80+</td>
<td>3.7%</td>
<td>10.4%</td>
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<tr>
<td>Number of people 65+</td>
<td>5.6 mln</td>
<td>10.2 mln</td>
</tr>
<tr>
<td>Number of people 80+</td>
<td>1.5 mln</td>
<td>3.5 mln</td>
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</tbody>
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## Polish telemedicine projects

<table>
<thead>
<tr>
<th>Public spending:</th>
<th>Private sector:</th>
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<tr>
<td>NOMED AF</td>
<td>COMARCH</td>
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<tr>
<td>LIFENET</td>
<td>InfoScan</td>
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<td>Teleangels care</td>
<td>Braster</td>
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<td>AMULET</td>
<td>Nestmedic</td>
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<td>COMODITY12</td>
<td>Medicalgorythms</td>
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<td>MedGo</td>
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<td></td>
<td>Telemedicine Poland</td>
</tr>
</tbody>
</table>
Estimates:
• 18% of Polish 65+ population might have AF
• 600 000 patients
• Only 30% of them know about disease
• About 30% of strokes of unknown origin is caused by AF

Goal:
• find an effective tool for screening atrial fibrillation
• prevention of strokes among population of 65+
Stroke

- Third most common cause of death (1.CV 2. Injuries 3. Strokes)
- High risk of permanent complications
- Main reason of disability among people 40+
- 130 mln € + 159 € spent annually

Atrial Fibrylation

- Cause of up to 20% of strokes
- 15 000 strokes annually
- Bad predictor for disability and death when combined with stroke
NOMED AF

- One of the leading telemedical research in Poland
- 3000 participants >65y.o.
- 30 days of constant ECG monitoring
- + HR, PPG and selective symptoms
- Visual and vibroacoustic signalisation of incidents of arrhythmia
- Results send to and monitored by the Kardiomed Silesia Center
- Under patronage of MoH and KEP
NOMED AF

Kamizelka NoMED

Stacja dokująca NoMED

Rejestrator EKG NoMED

Rejestrator nadgarstkowy
• Cardiovascular diseases are the leading cause of death in Poland
• Poland has excellent net of more than 100 hemodynamic wards
• The main challenge is transportation time
ERT reaches the patient

Basic examination

ECG

Teletransmission to the Heart Team

Transport to the hospital + Prehospital procedures
LIFENET

Goals:
1. Golden Hour
   1. Minimalizing the time between onset of symptoms to reperfusion among STEMI patients
2. Cost efficiency
   2. Paramedics can carry out ECG and contact with Heart Team – MD is not required in ambulance
3. Prehospital advanced care
   3. The ERT may perform non-standard, advanced procedures guided by the cardiologist
Teleangels

• Provincial Małopolska program started in February 2018 (9mln €)
• Problems with daily activities due to age, disability or mental illness.
• 65+ population in Małopolska Region:
  – 2015: 0,515 mln
  – 2050: 1 mln
Teleangels

• The 24/7/356 Center of Telecare
• 10 000 participants
• Band with SOS button and SIM card
• 3 200 people will be granted professional or neighbour care services
• Mean time of care for one participant is 20h per month
AMULET

- Goal: establish more cost efficient long term management of patients with cardiac insufficiency
- Cardiac insufficiency: 1 mln patients, 60 000 of them dies annually
- Leading cause of hospitalization in Poland among 65+ population
- 15 times more expensive hospitalizations
- 11% of all hospitalizations
- Mean waiting time to see a cardiologist: MONTHS
AMULET

Participants:

- LVEF ≤49%;
- NYHA I-II with at least one hospitalization due to cardiac insufficiency in the last 6 months
- No major CV incidents in the last 40 days
• Platform for communication, gathering and analyzing medical data
• Monitoring with use of modern technological techniques and telemedicine
• Prospective, restrospective and randomized research
• Creating opimall models of care and mnitoring patients with CI

GP office  Patient home
Methods
• 60 patients with drug dependent DM2 for >6 months prior
• 6 weeks long follow up
• a Bluetooth-enabled glucometer, blood pressure reader and scale
• a Bluetooth-enabled sensor of ECG, heart rhythm, and respiratory movements

Outcome measures
• Technical functionality
• Glycaemic control parameters (HbA1c, plasma glucose levels) arterial blood pressure
• Patient adherence to medication
• Health-related quality of life
Health spending

https://data.oecd.org/healthres/health-spending.htm
COMARCH Healthcare
Leading Polish IT and tech company founded in Kraków

- Electronic Health Record
- Hospital Information System
- eHealth
- eCare
- iMed24
COMARCH Healthcare
Leading Polish IT and tech company founded in Kraków

- Teleradiology - teleDICOM
- Telecardiology - remote ECG monitoring
- Telegynecology - remote CTG
- Telegeriatriecs - remote care for seniors

- Life bracelet
- HTA device
- CardioVest
- Electronic Life Card
- Tech and IT provider for many public programs i.e.g:
  - NOMED-AF
  - Teleangels
InfoScan
Obstructive Sleep Apnoea

• SaO2
• PPG, HR
• Chest wall movement
• Nasal and oral airflow
• Snoring sounds
• Body positioning
• Analysis by the specialist in 24h
• Cost – 35 €
Braster
Breast self-exam tool

- Prophylaxis of breast cancer
- Uses termography to map potentially malignant neoplastic lesions in breasts
- Examination last for about 15min
- Then it is sent to the Telemedical Center
- The results are sent back withining 48h
• Fetal heart rate
• Contractions of the uterus
• Fetal movement
• Mothers heart rate
Nestmedic
Home CTG
Medicalgorythms
ECG monitoring

- Unlimited time of monitoring
- Detection of arrythmia by advanced algorythms
- Life data transmission
- Subjective symptoms
- Telemonitoring and telerehabilitation
MedGo
Cardiac monitoring

• Unlimited time of monitoring
• IT platform for patients and physicians
• Cloud data storage
• Telemonitoring and telerehabilitation
J. Dietl Specialist Hospital in Kraków

- 400 beds
- 800 employees
- 30,000 hospitalizations annually
- 50,000 ambulatory patients

- **Internal diseases**: allergology, diabetology, endocrinology, gastroenterology, hematology, **Cardiology** and clinical pharmacology
- **Neurology**
- **Rheumatology**
- **Rehabilitation**

Broad diagnostic panel:
The Institute of Diagnostic Imaging (i.e. CT, MRI), Gastrointestinal Endoscopy, the EEG Laboratory, the Laboratory of Cardiovascular Organ Function Tests and Hemodynamic, the Laboratory of Spirometry

Educational cooperation for physicians (students trainings, graduate internships, specialization trainings in the field of internal medicine), medical students and students at Kraków medical faculties including nursing, dietetics, physiotherapy and massage.
Thank you for your attention