

**Anni 70: primi tentativi di Teleconsulto e Telemonitoraggio, tramite impiego tecnologia TV per veicolare informazioni a distanza. Dati audio e video non integrati**

**Anni 80: reti ISDN (Integrated Services Digital Network) consentono il trasferimento di dati integrati (voce, video e biometrici). Nascono i primi networks.**

**Anni 90: tramite Internet la quantità di dati inviabile diviene importante ed accessibile (costi bassi). Nascono Teleconsulto e Telemonitoraggio in tempo reale**

**Anni 00: regolamentazione (privacy) e legislazione europea GDPR (General Data Protection Regulation)**

**2019-2020: grazie a SARS-COVID-19 le regioni promuovono un'accelerazione globale della telemedicina**

## **opportunità offerte dalla telemedicina**

***migliore qualità dell'assistenza  
garantendo la continuità delle cure***

servizio del medico a domicilio del paziente  
senza che questo si allontani dallo studio

soluzioni per il paziente cronico  
come  
auto-gestione e monitoraggio remoto

*integrazione Ospedale-Territorio*

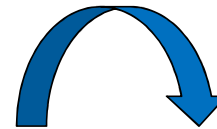


## **opportunità offerte dalla telemedicina**



*OMS-Comitato Regionale Europeo  
Malta, 10-13 settembre 2012*

**Salute 2020:  
una politica di riferimento europea a sostegno  
di un'azione trasversale ai governi  
e alle società per la salute e il benessere**



***rafforzare i sistemi sanitari centrati sulla persona  
e potenziare le capacità di sanità pubblica e la preparazione,  
sorveglianza e risposta alle emergenze***

## Aree prioritarie

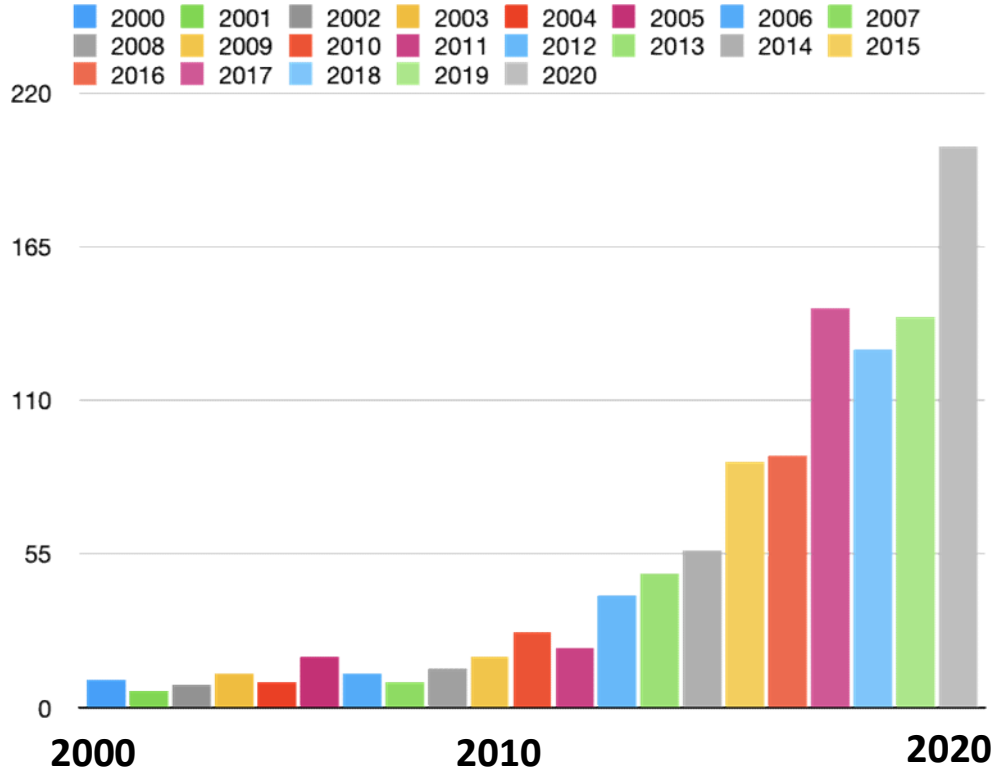


*36- ...ottenere un'assistenza di alta qualità e il miglioramento dei risultati sanitari*

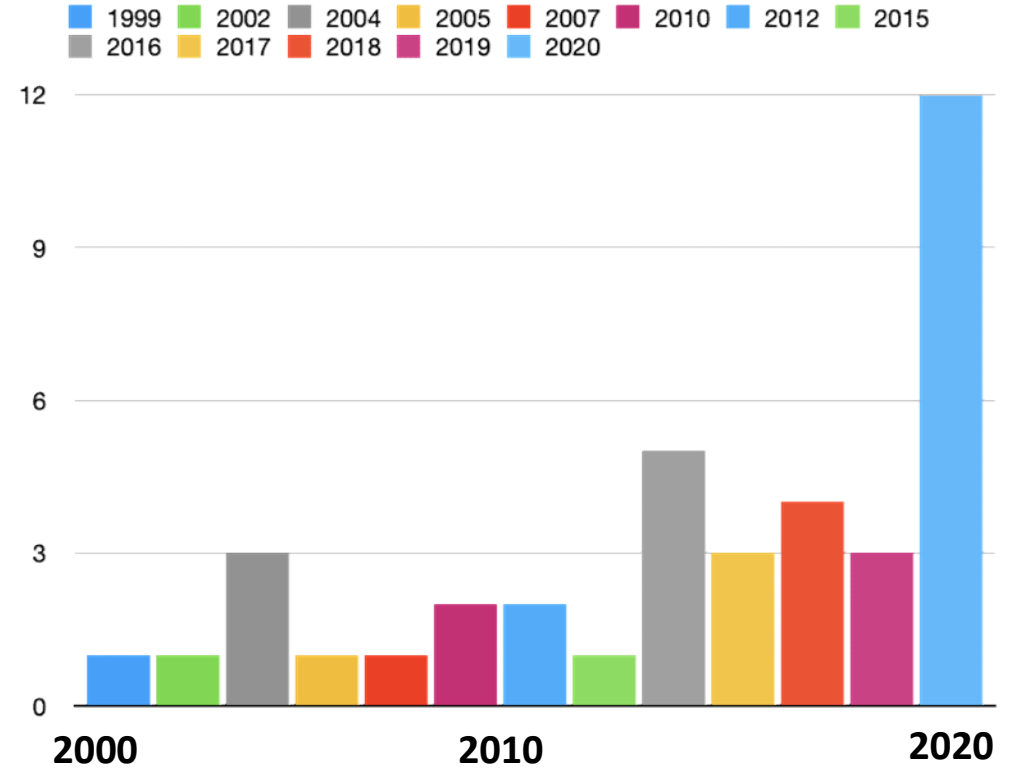
*richiede **sistemi sanitari che siano sostenibili** dal punto di vista finanziario, adatti allo scopo, centrati sulla persona e basati sulle evidenze scientifiche*

*38- ...utilizzare fino in fondo gli strumenti e le innovazioni del 21° secolo come la tecnologia delle comunicazioni – documenti digitali, **telemedicina** ed e-health – e i social media può contribuire a migliorare l'assistenza e renderla più efficace in relazione ai costi*

### Telemedicine AND Neurology



### Telemedicine AND Neurophysiology



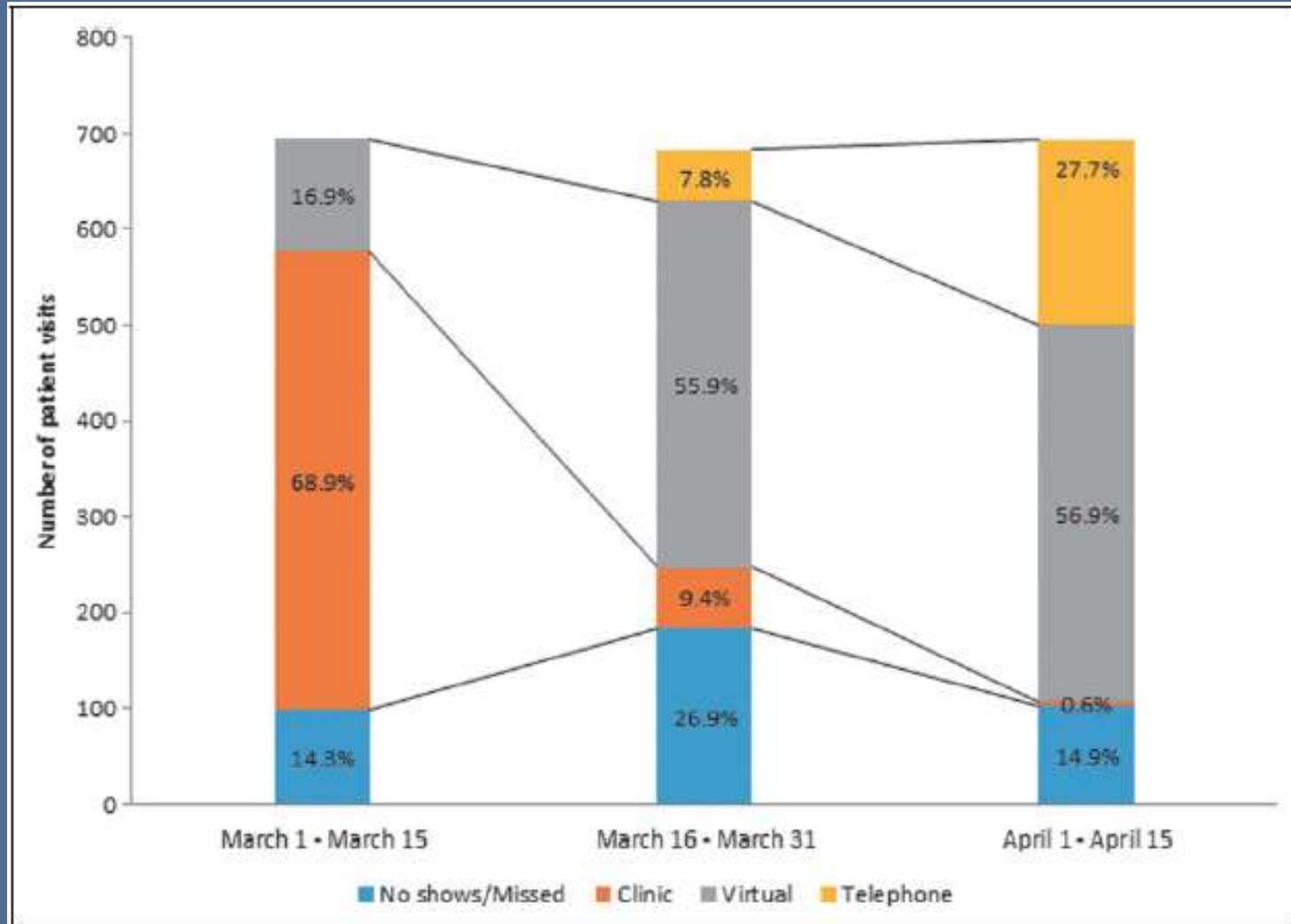
# Evidence of a Rapid Shift in Outpatient Practice During the COVID-19 Pandemic Using Telemedicine

Vineet Punia, MD, MS, Gaele Nasr, MPH, Victoria Zagorski, MBA, George Lawrence, MBA, Jessica Fesler, MD, Dileep Nair, MD, and Imad Najm, MD

TELEMEDICINE and e-HEALTH

2020

Epilepsy Center  
Cleveland, Ohio



22/09/2020

# The Use of Social Media and Digital Devices Among Italian Neurologists

Luigi Lavorgna<sup>1\*</sup>, Francesco Brigo<sup>2,3\*</sup>, Gianmarco Abbadessa<sup>4</sup>, Sebastiano Bucello<sup>5</sup>, Marinella Clerico<sup>6</sup>, Eleonora Cocco<sup>7</sup>, Rosa Iodice<sup>8</sup>, Roberta Lanzillo<sup>8</sup>, Letizia Leocani<sup>9,10</sup>, Alberto Lerario<sup>11</sup>, Marcello Moccia<sup>8,12</sup>, Alessandro Padovani<sup>13</sup>, Luca Prosperini<sup>14</sup>, Anna Repice<sup>15</sup>, Maria Stromillo<sup>16</sup>, Francesca Trojsi<sup>17</sup>, Gianluigi Mancardi<sup>18</sup>, Gioacchino Tedeschi<sup>17</sup> and Simona Bonavita<sup>4</sup> on behalf of the study group on "Digital technologies, web and social media" of the Italian Neurological Society

Are we ready for such a shift?

frontiers  
in Neurology

2020

Survey online (January-May 2018) 405 neurologists – SIN

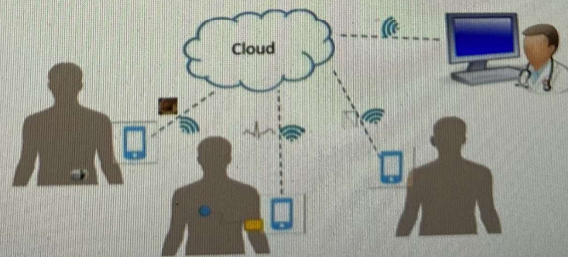
Sin  
SOCIETÀ ITALIANA DI NEUROLOGIA

**56%** use social media to communicate with patients, although 65% are against a friendship with them on social media.

**65%** of participants interact with patients on social media outside working hours and think that social media have improved the relationship with patients

**67%** have no wearable devices available in clinical practice

The availability of digital devices in the structures of the Italian NHS is still too limited





Are we ready for such a shift?

# Google: COVID-19 Community Mobility Report

Dati relativi alla Toscana 31 luglio-11 sett

A fine agosto la app è scaricata da 5 milioni di persone



Cioè copre il 13% della popolazione italiana



Cioè copre quasi il 100% della popolazione



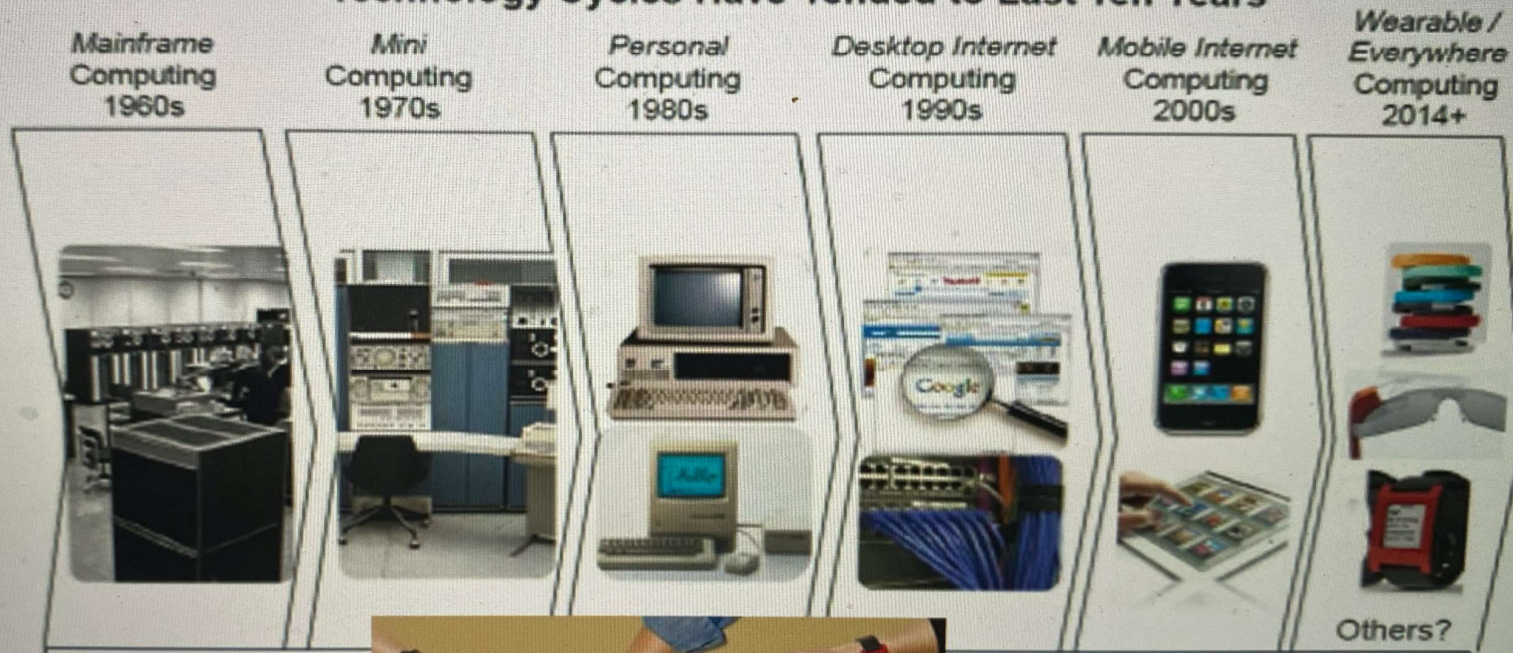
- sperimentazioni locali della Telemedicina che si sono succedute fin dal 2004 (es.: Careggi – Firenze e, successivamente, ospedale di Terni, poi seguite da molte altre)
- GdS TELEMEDICINA della SINC (fine 2016)
- Centro Nazionale di Telemedicina – (collaborazione con Prof. Gabbrielli) ed un capitolo interamente dedicato al GDPR (General Data Protection Regulation)
- linee di Indirizzo Nazionale sono state approvate dal Consiglio Direttivo SINC e dalla Presidenza SINC (sito web SINC)

**A cura di: Giuseppe Stipa, Silvia Lori, Antonello Grippo, Aldo Amantini**

# Digital Technologies: The “wearable era”

## 2015-2025: The wearable decade

Technology Cycles Have Tended to Last Ten Years



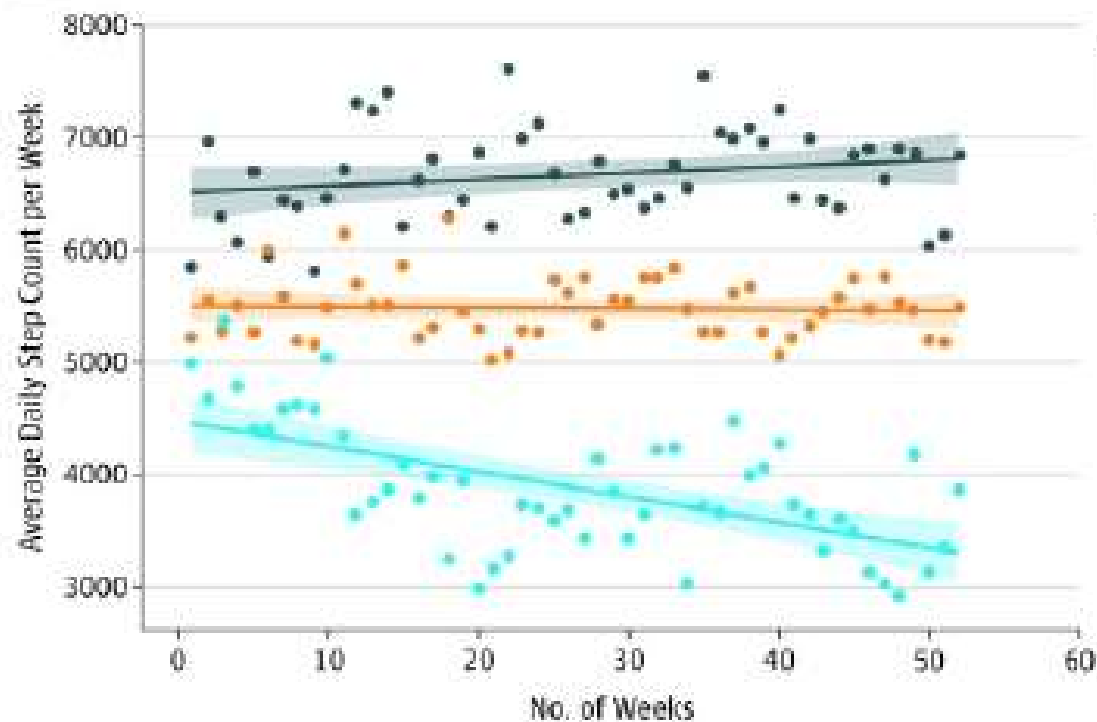
# Association of Continuous Assessment of Step Count by Remote Monitoring With Disability Progression Among Adults With Multiple Sclerosis

Block et al 2019

JAMA Network | Open.

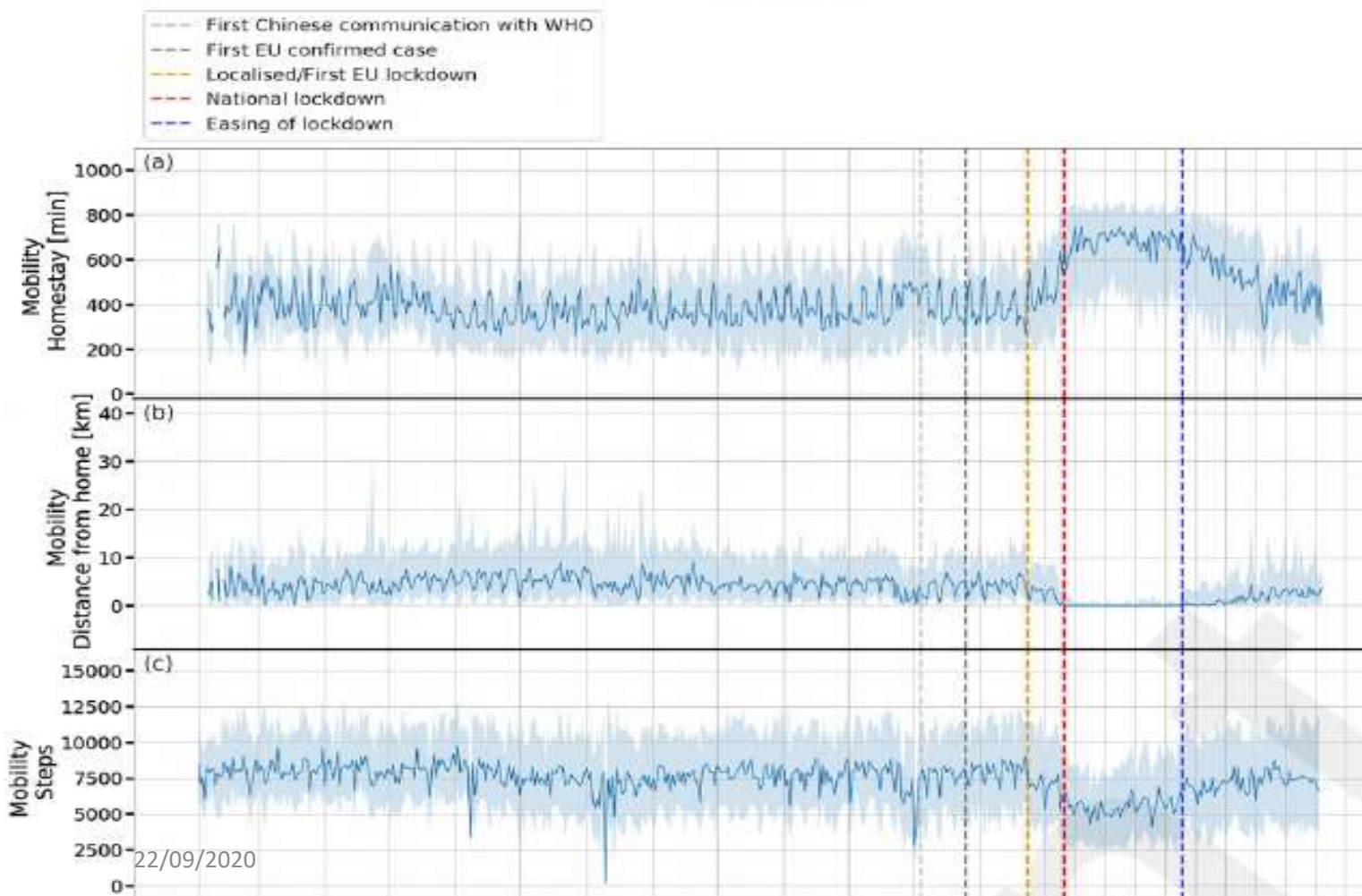
95 RR/PMS able to walk >2 minutes with or without support - Fitbit Flex  
1 year Daily step count worsening vs Timed 25-FootWalk, Timed-Up-and-Go  
12-item MS-Walking Scale

**A** Change in average daily steps per week by clinically meaningful change in EDSS



**Methods:** We analysed data extracted from smartphone and wearable devices and managed by the RADAR-base from 1062 participants recruited in Italy, Spain, Denmark, the UK, and the Netherlands. We derived nine features on a daily basis including time spent at home, maximum distance travelled from home, maximum number of Bluetooth-enabled nearby devices (as a proxy for physical distancing), step count, average heart rate, sleep duration, bedtime, phone unlock duration, and social app use duration. We performed Kruskal-Wallis tests followed by post-hoc Dunn's tests to assess differences in these features among

Milan, Italy



Using smartphones and wearable devices to monitor behavioural changes during COVID-19

Sun et al. 2020, for the RADAR Consortium

# Long-Term Home-Monitoring Sensor Technology in Patients with Parkinson's Disease—Acceptance and Adherence

Botros et al. 2019, Sensors

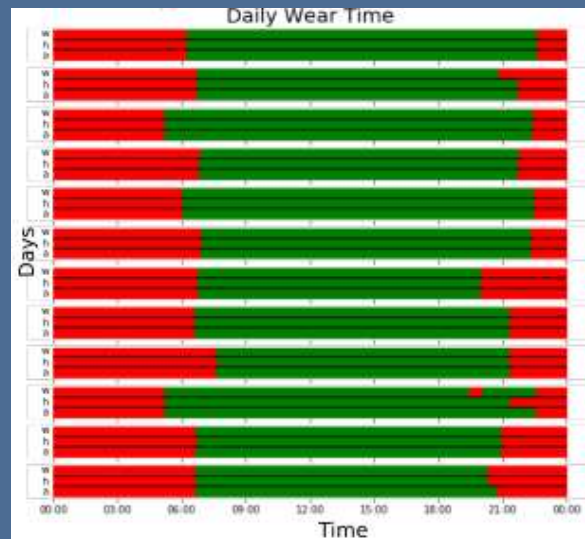
## SENSORS

3 Body worn



7 Ambient

One month of continuous monitoring



System Usability Scale: 71.5%

Acceptance scores:  
87% for body sensors  
100% for ambient sensors

Table 3. Classification results, based on preliminary usability tests.

Motor Symptom	Sensitivity	Specificity	Precision
Bradykinesia	69.8%	68.3%	70.1%
Dyskinesia	69.0%	72.2%	72.5%
Tremor	74.2%	69.7%	70.8%

22/09/2020

# At home monitoring of epileptic activity and even DBS regulation

Received: 16 April 2020 | Revised: 16 June 2020 | Accepted: 5 July 2020  
DOI: 10.1111/epi.16639

CRITICAL REVIEW AND INVITED COMMENTARY

## Epilepsia

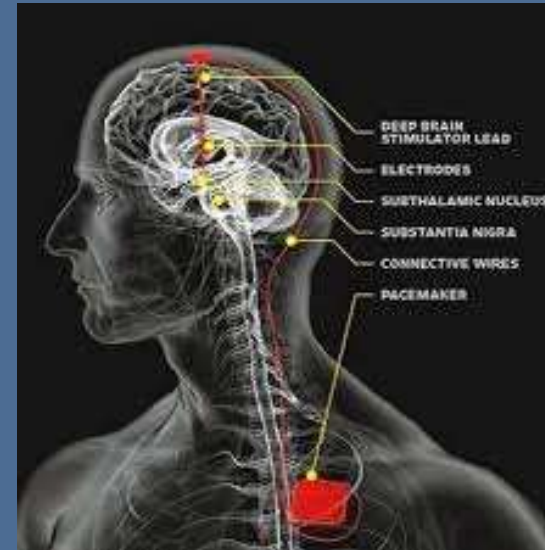
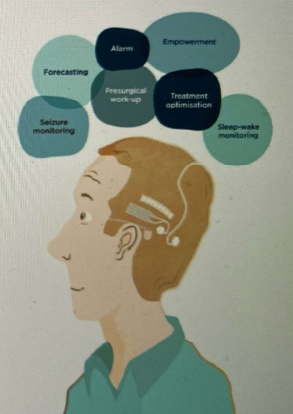
### A new era in electroencephalographic monitoring? Subscalp devices for ultra-long-term recordings

Jonas Duun-Henriksen<sup>1,2</sup> | Maxime Baud<sup>3,4</sup> | Mark P. Richardson<sup>1</sup> | Mark Cook<sup>5,6</sup> | George Kouvas<sup>4</sup> | John M. Heasman<sup>7</sup> | Daniel Friedman<sup>8</sup> | Jukka Peltola<sup>9</sup> | Ivan C. Zibrandtsen<sup>10</sup> | Troels W. Kjaer<sup>10,11</sup>

**Key Points**

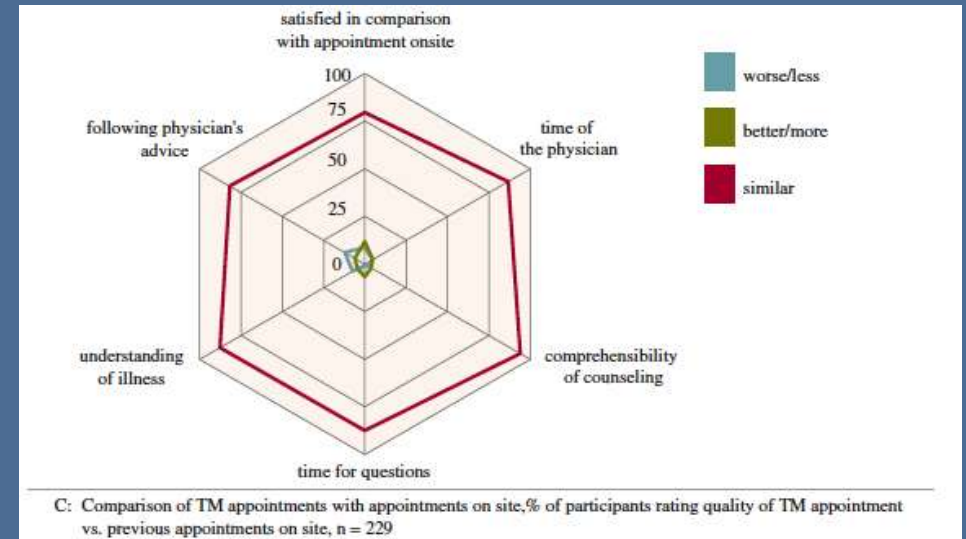
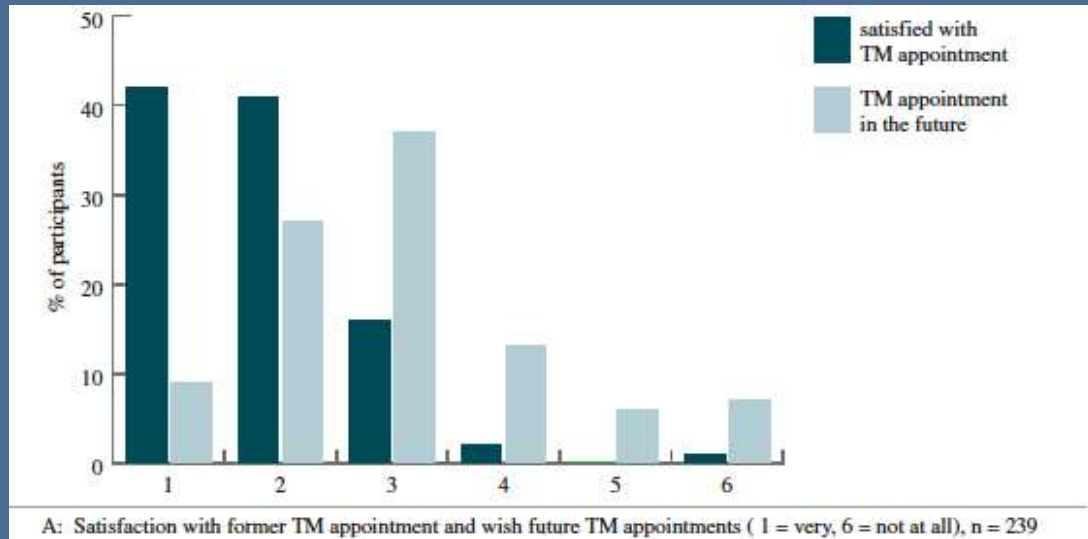
- A new generation of subscalp, continuous brain monitoring systems have the potential to advance treatment and diagnosis in epilepsy
- First studies comparing subscalp recordings with scalp EEG are favorable and show that seizures can be documented electrographically
- Adoption of subscalp, ultra-long-term EEG monitoring may cause a shift from subjective seizure reporting to objective seizure counting
- The true value of ultra-long-term EEG has yet to be proven; more data collected over long periods of time are essential to show the benefit

Epilepsia e Telemedicina-Mecarelli, SINC 2020



# Counseling of people with epilepsy via telemedicine: Experiences at a German tertiary epilepsy center during the COVID-19 pandemic

Randi von Wrede, Susanna Moskau-Hartmann, Tobias Baumgartner, Christoph Helmstaedter, Rainer Surges \*



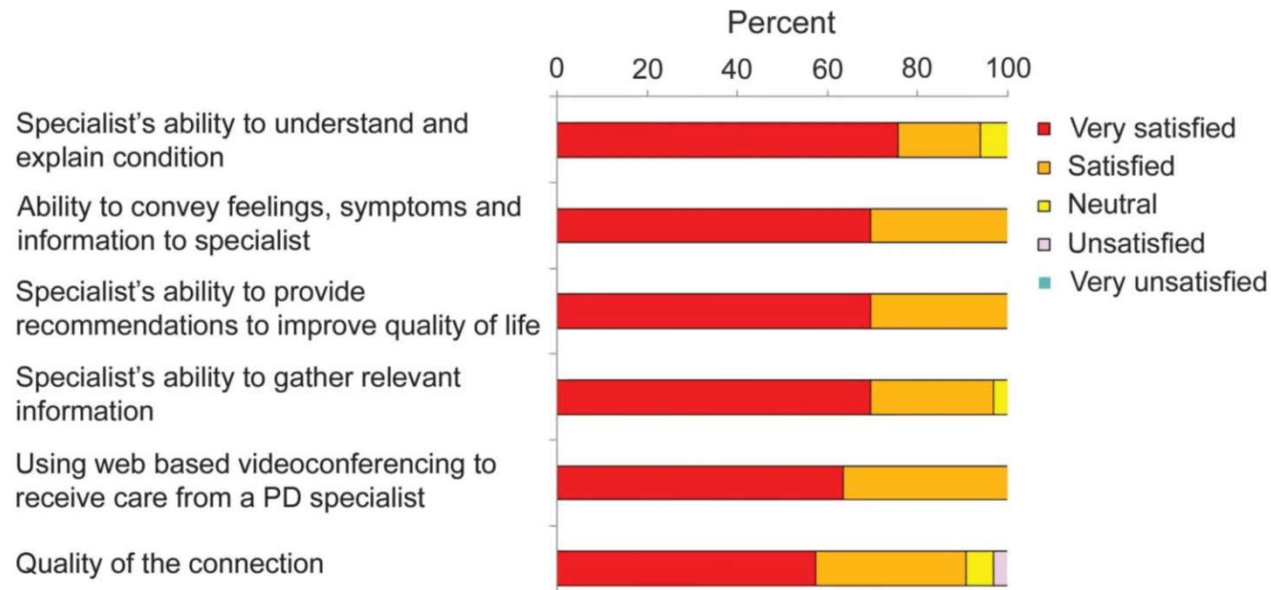


# Virtual visits for Parkinson disease

Neurology<sup>®</sup> Clinical Practice

A case series

## Grado di soddisfazione dei pazienti Parkinson nei confronti della “televisita”



Acceptability of  
Telemedicine, 2

*Where barriers to reimbursement for telemedicine care do not exist (e.g., Canada and the Veterans Affairs system), telemedicine is flourishing and expanding access to care.*

# Prevalence and impact of COVID-19 in Parkinson's disease: evidence from a multi-center survey in Tuscany region

Journal of Neurology

Received: 8 June 2020 / Revised: 12 June 2020 / Accepted: 16 June 2020

Eleonora Del Prete<sup>1</sup> · Alessio Francesconi<sup>1</sup> · Giovanni Palermo<sup>1</sup> · Sonia Mazzucchi<sup>1</sup> · Daniela Frosini<sup>2</sup> · Riccardo Morganti<sup>3</sup> · Piero Coleschi<sup>4</sup> · Laura Maria Raglione<sup>5</sup> · Paola Vanni<sup>6</sup> · Silvia Ramat<sup>7</sup> · Alessio Novelli<sup>8</sup> · Alessandro Napolitano<sup>9</sup> · Carla Battisti<sup>10</sup> · Martina Giuntini<sup>11</sup> · Carlo Rossi<sup>12</sup> · Chiara Menichetti<sup>13</sup> · Monica Ulivelli<sup>14</sup> · Valentino De Franco<sup>14</sup> · Simone Rossi<sup>14</sup> · Ubaldo Bonuccelli<sup>1</sup> · Roberto Ceravolo<sup>1</sup>  · Tuscany Parkinson COVID-19 Participants

## Conclusion

A higher prevalence of COVID-19 in the PD population respect to prevalence of COVID-19 in Italy, also when stratified for age, was found. Prevalence of COVID-19 in our PD population was also higher than prevalence of COVID-19 in Tuscany. It is not clear if PD itself could represent a risk factor for COVID-19. Our COVID-19 PD patients presented the same risk factors for COVID-19 that are found in general population, as hypertension and diabetes. We also explored the effect of lockdown on motor and non motor symptoms in PD and we did not find a subjective worsening of symptoms in this period. We also show that PD patients in Tuscany are strongly interested in Telemedicine, although it seems appropriate to widen the availability of technical facilities.

740 Pd patients; 0.9% (7) COVID positive  
0.13% mortality; 14% case fatality

No additional risk factors than those reported in the general population (diabetes, hypertension)

No worsening of motor symptoms, neither of mood, sleep or anxiety during lockdown

72.5% of patients were favorable with telemedicine, but:  
**only 40% through their General Practitioner**