Sergio Pillon

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Un esempio di uso virtuoso del FSE

J Am Med Inform Assoc. 2016 Sep; 23(5): 879–890.
Published online 2016 Feb 15. doi: 10.1093/jamia/ocv195
PMCID: PMC4997037
PMID: 26911814

Development and validation of a predictive model for detection of colorectal cancer in primary care by analysis of complete blood counts: a binational retrospective study

Yaron Kinar,[1] Nir Kalkstein,[1] Pinchas Akiva,[1,*] Bernard Levin,[2] Elizabeth E Half,[3] Inbal Goldshtein,[4] Gabriel Chodick,[4] and Varda Shalev[4,5]

Materials and Methods Primary care data were collected from a cohort of 606 403 Israelis (of whom 3135 were diagnosed with CRC) and a case control UK dataset of 5061 CRC cases and 25 613 controls. The model was developed on 80% of the Israeli dataset and validated using the remaining Israeli and UK datasets. Performance was evaluated according to the area under the curve, specificity, and odds ratio at several working points.

Results Using blood counts obtained 3–6 months before diagnosis, the area under the curve for detecting CRC was 0.82 ± 0.01 for the Israeli validation set. The specificity was 88 ± 2% in the Israeli validation set and 94 ± 1% in the UK dataset. Detecting 50% of CRC cases, the odds ratio was 26 ± 5 and 40 ± 6, respectively, for a false-positive rate of 0.5%. Specificity for 50% detection was 87 ± 2% a year before diagnosis and 85 ± 2% for localized cancers. When used in addition to the fecal occult blood test, our model enabled more than a 2-fold increase in CRC detection.

Discussion Comparable results in 2 unrelated populations suggest that the model should generally apply to the detection of CRC in other groups. The model's performance is superior to current iron deficiency anemia management guidelines, and may help physicians to identify individuals requiring additional clinical evaluation.

Conclusions Our model may help to detect CRC earlier in clinical practice.

Tanti dati: un problema ed una soluzione allo stesso tempo

Il modello Israeliano

much data
HELP
But the problem is also part of the solution...
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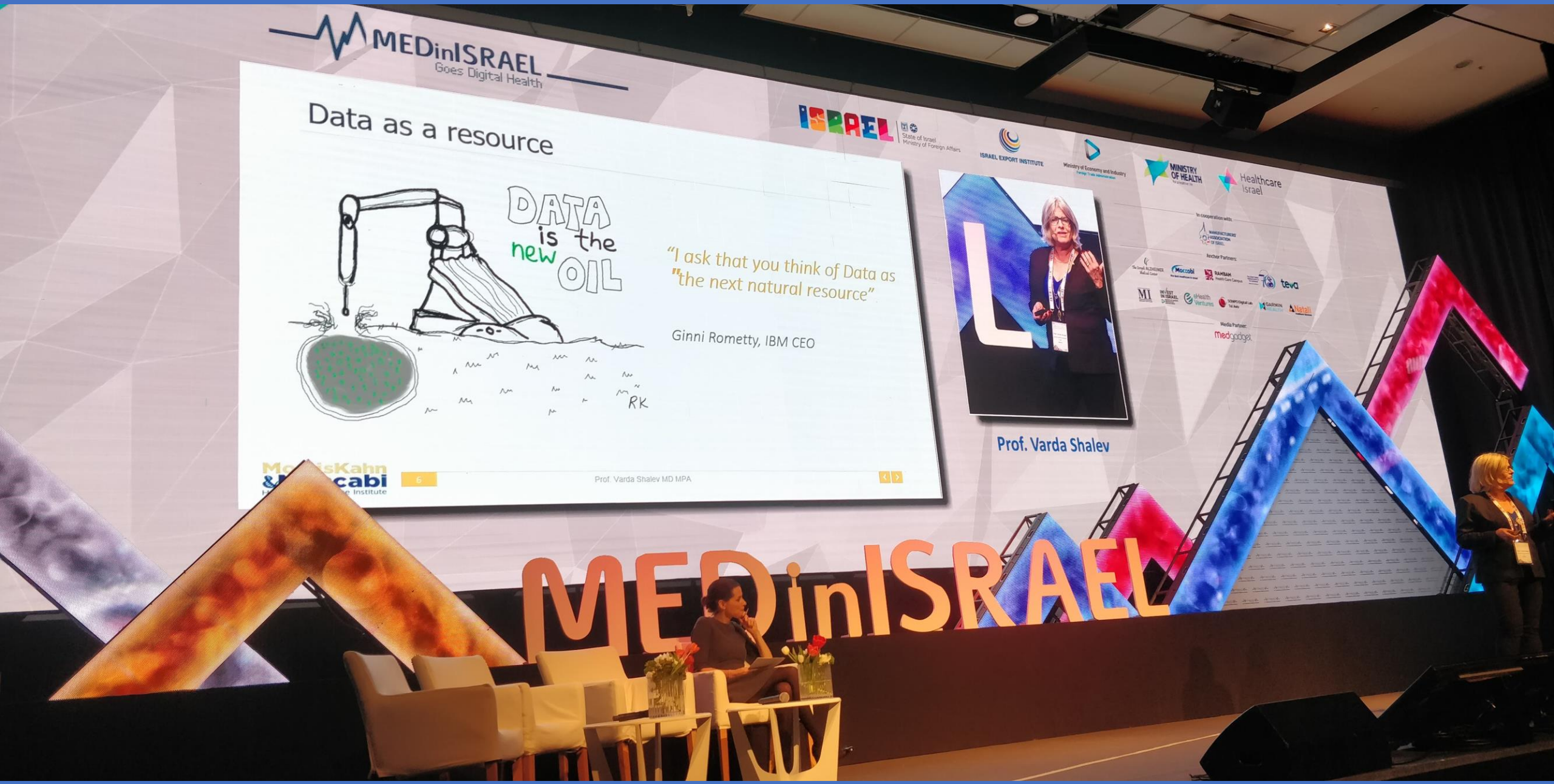
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Data as a resource
DATA is the new OIL
RK
"I ask that you think of Data as "the next natural resource"
Ginni Rometty, IBM CEO
6
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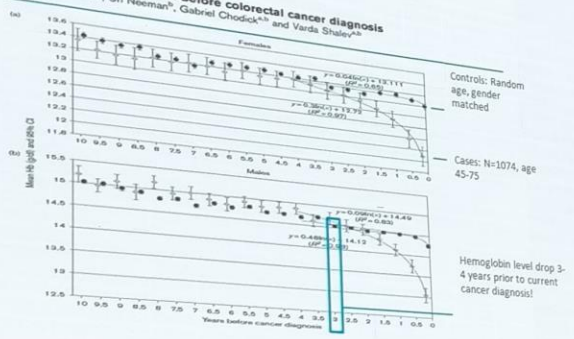
Previous Work – Descriptive

Variations in hemoglobin before colorectal cancer diagnosis

Inbal Goldshtein[a], Uri Neeman[b], Gabriel Chodick[a,b] and Varda Shalev[a,b]



Controls: Random age, gender matched

Cases: N=1074, age 45-75

Hemoglobin level drop 3-4 years prior to current cancer diagnosis!

* European Journal of Cancer Prevention 2010, 19:342–344

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Personalized Predictive Analytics
and Big Data
Early detection of Colorectal Cancer
MedialCS
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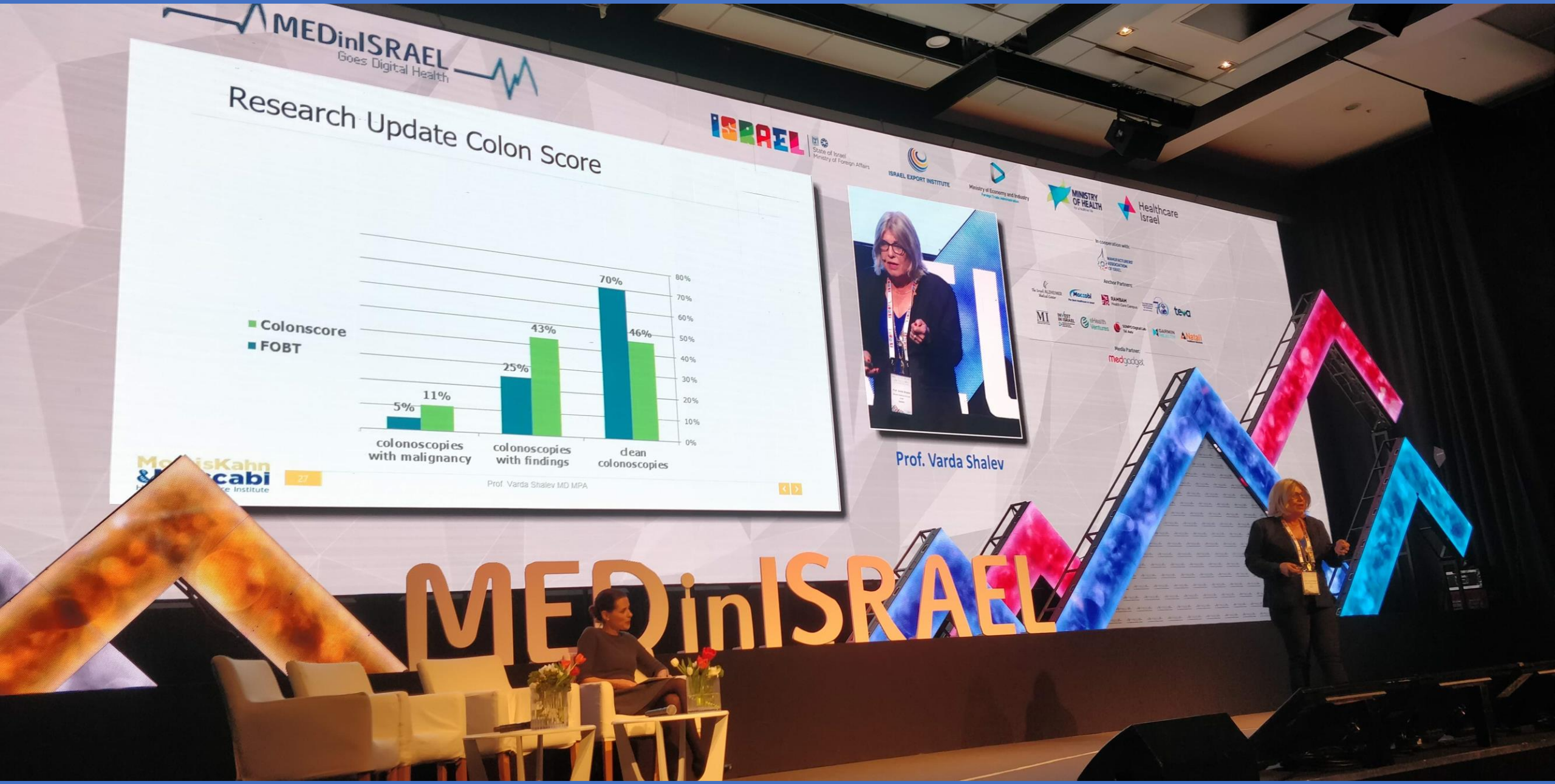
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Research Update Colon Score
Colonscore
FOBT
5%
11%
25%
43%
70%
46%
80%
70%
60%
50%
40%
30%
20%
10%
0%
colonoscopies with malignancy
colonoscopies with findings
clean colonoscopies
27
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HEALTH AND HEALTHCARE IN THE AGE OF IN

we have decided
Ap

Conference Co
Prof. Isa
Prof. Ra

Conferei
- Data drive
- 'Uber'izati
- Innovatior of healthc
- New chall innovatio

Tuesday, March 20, 2018

Big Data the 'new gold Healthcare Dive

Each time there is a new IT develo rush into the newly created vacuur

- "Healthcare is becoming a reported. More than 2,310 projected to be produced b that were produced in 201
- Human data and the abilit transforming healthcare a giants eager to cash in on reported.
- The data are coming from 86% penetration rate and sold in 2017, according to health history, medical cla academic research generat data a day — or about 30% reported.

Cookies on Forbes

Forbes

Billionaires Innovation Leadership Money Consumer Industry Lif

4,243 views | Mar 26, 2019, 09:36am

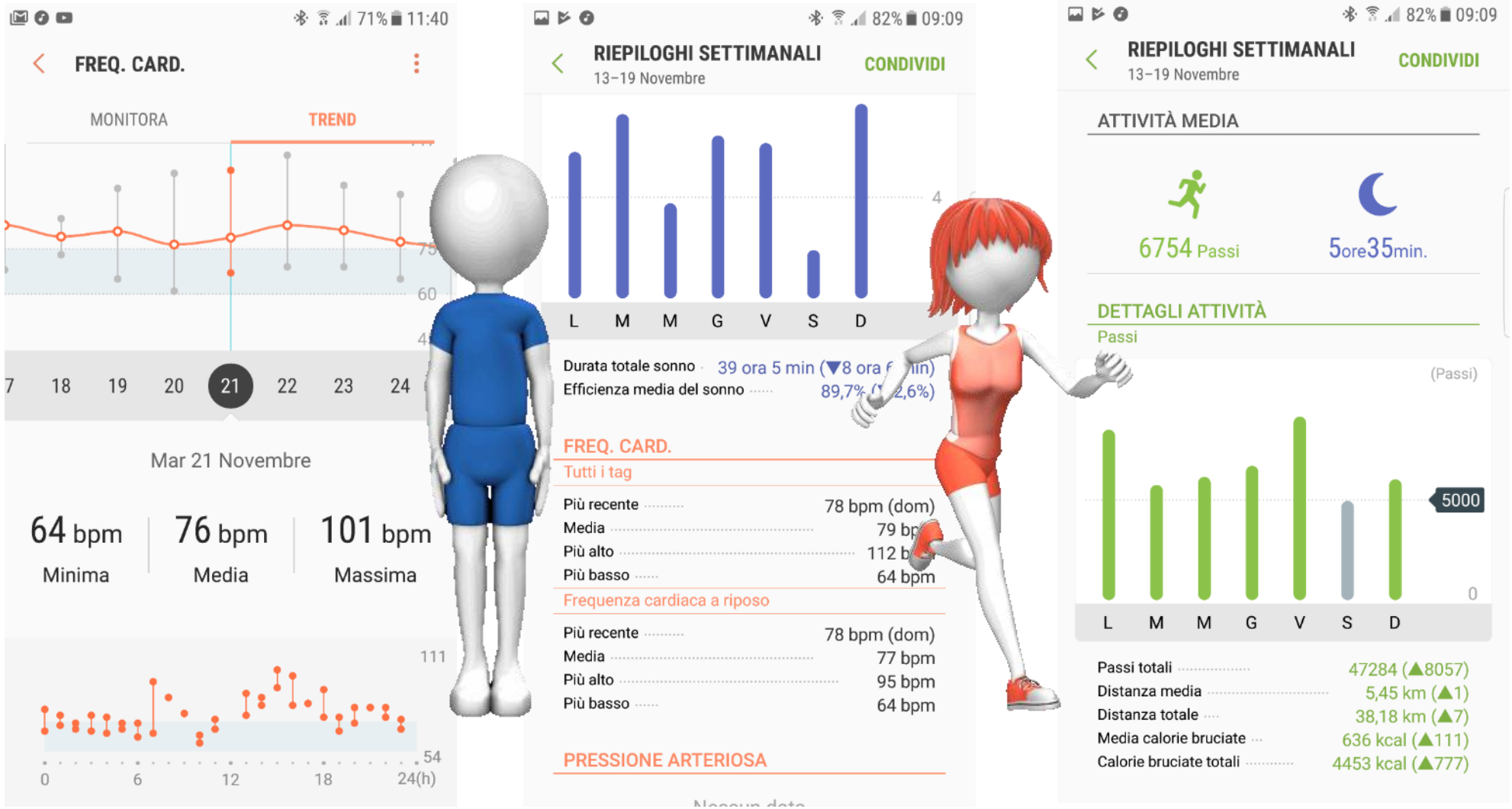
How Israel Turned Decades Of Medical Data Into Digital Health Gold

Amir Mizroch Contributor
Start-Up Nation Central Contributor Group
Amir is the Director of Communications at Start-Up Nation Central.

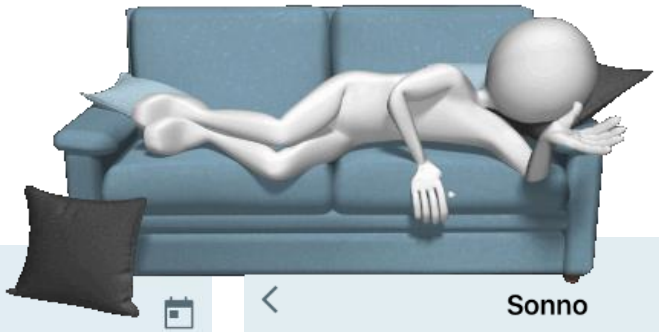
Guest post by Moshe Bar Siman Tov, Director General of the Israel Ministry of Health.

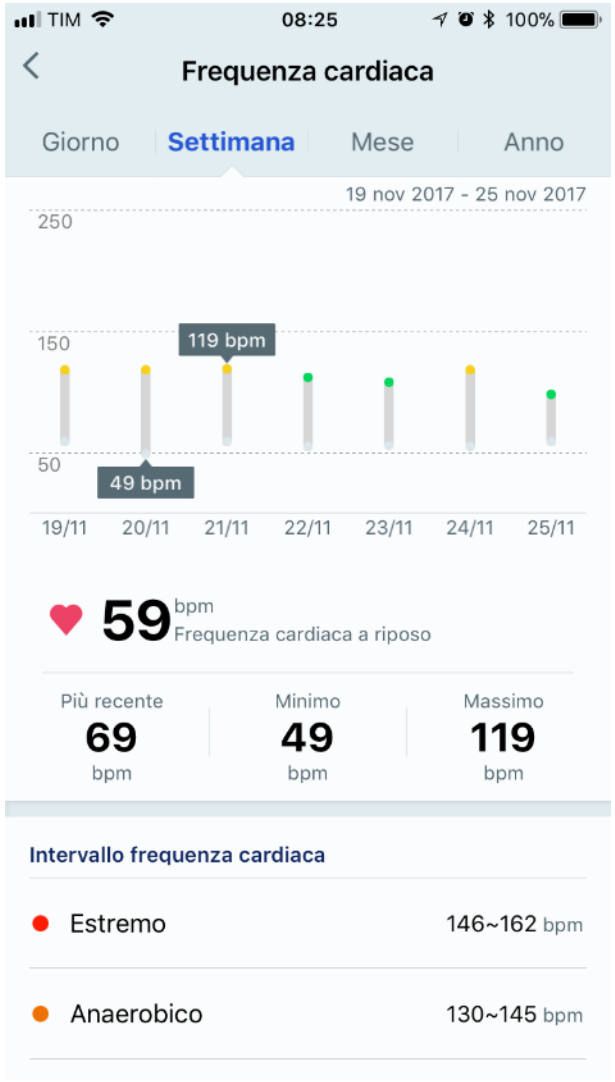
All over the world, healthcare systems are struggling to provide the service their patients demand while also working within the legal and budgetary constraints set by governments or other institutions like insurance companies and hospitals. Digitization of medical records and new medical technologies have yet to touch large swathes of the world's medical institutions. In many countries, because of differences in the way records are kept, healthcare services and organizations are unable to "talk" to each other and cannot share data. That makes for inefficiency; if data cannot be shared between institutions, things as basic as blood tests need to be repeated each time a patient goes to a different doctor or institution.

Tutti abbiamo dispositivi che misurano «i passi», associabili alla frequenza cardiaca..



E al sonno….




TIM 08:25 100%
Frequenza cardiaca
Giorno Settimana Mese Anno
19 nov 2017 - 25 nov 2017
250
150
50
119 bpm
49 bpm
19/11 20/11 21/11 22/11 23/11 24/11 25/11
59 bpm
Frequenza cardiaca a riposo
Più recente 69 bpm
Minimo 49 bpm
Massimo 119 bpm
Intervallo frequenza cardiaca
Estremo 146~162 bpm
Anaerobico 130~145 bpm

TIM 08:24
Sonno
Giorno Settimana Mese Anno
Ora di dormire 00:10
Ora di alzarsi 08:01
Sveglio
Sonno REM
Sonno leggero
Sonno profondo
Qualità sonno
76
Assicurati un sonno della durata sufficiente per avere tanta energia. Sei andato a dormire alle 00:10 la scorsa notte, che è un po' tardi.
Assicurati un sonno della durata sufficiente per avere tanta energia. 22:00-06:00 è il momento ideale per riposare. Puoi utilizzare Huawei Wear per impostare sveglie che ti aiutino a rispettare orari regolari.
2 ore 6 min
4 ore 18 min
1 ore 22 min

100%
Sonno
Giorno Settimana Mese Anno
Sonno totale 7 ore 46 min
Sonno profondo 27%
Sonno leggero 55%
Sonno REM 18%
Continuità sonno profondo 54 punti
Sveglio 1 volte
Qualità respiro 70 punti
Pisolini 0 minuti
HUAWEI TruSleep™ supporta solo le statistiche per 3 ore o più di sonno

TIM 08:25 100%
Sonno
Giorno Settimana Mese Anno
19 nov 2017 - 25 nov 2017
9 ore 10 min
7 ore 48 min
19/11 20/11 21/11 22/11 23/11 24/11 25/11
Sveglio
Sonno REM
Sonno leggero
Sonno profondo
Qualità del sonno (media)
71
La tua qualità di respirazione durante il sonno registrata è sotto la media per 5 giorni in questa settimana, un aumento del 0 giorni rispetto alla scorsa settimana. Migliora la tua qualità di vita!
Con l'aumento di peso, il contenuto di grasso del palato molle e la parete della gola e il volume dei tessuti molli intorno al collo aumentano, aspetto che porta a russamento per respirazione irregolare. L'esercizio fisico regolare e una dieta sana possono prevenire l'aumento di peso.

Ma per persone anziane o fragili i dati dei «sensori» sono ancora piu’ importanti..

Indicatori di profilo del glucosio (con valori del glucosio)

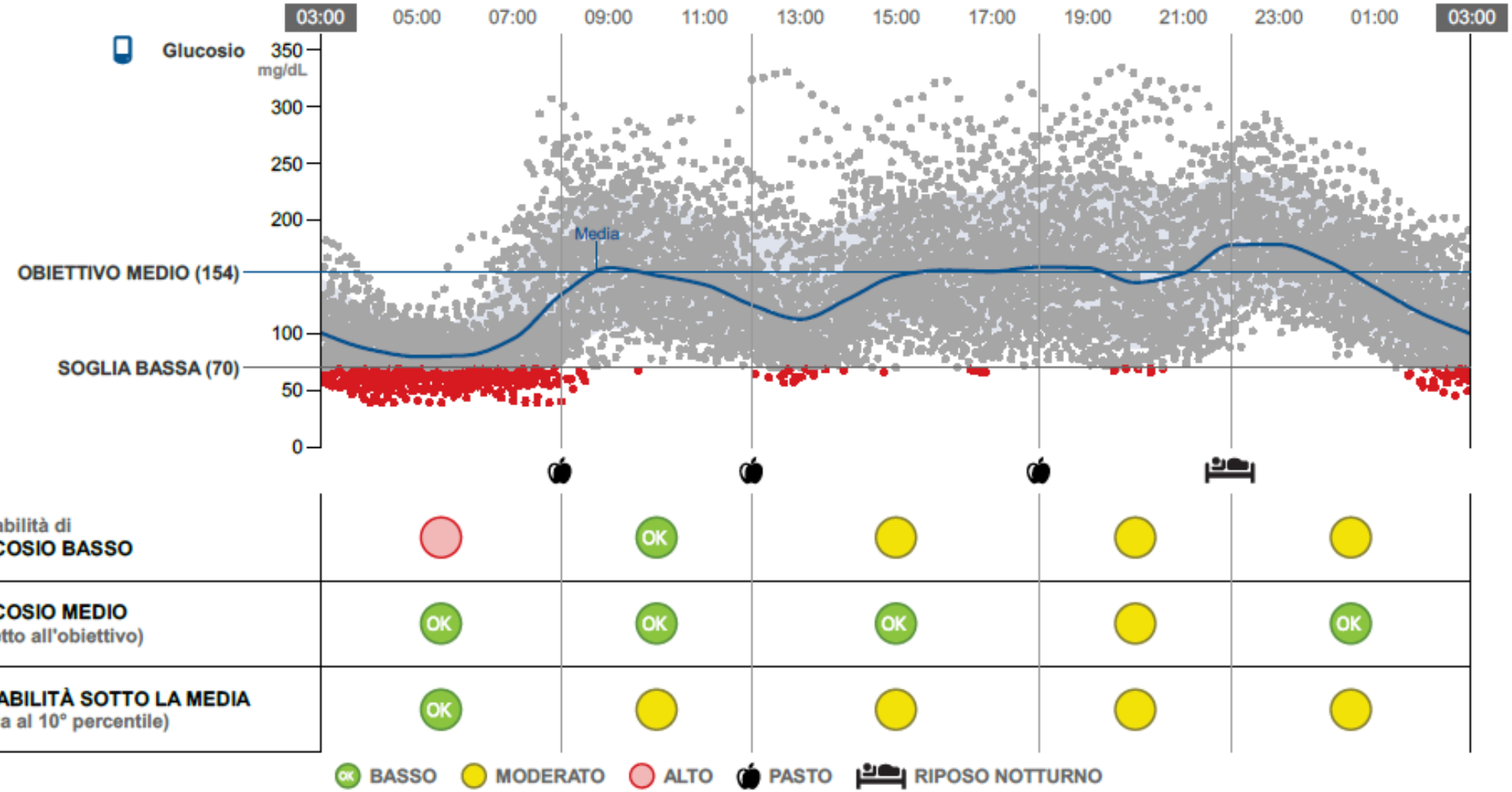
FreeStyle Libre

1 gennaio 2019 - 31 marzo 2019 (90 giorni)

IMPOSTAZIONE GLUCOSIO BASSO CONSENTITO: Medio

IMPOSTAZIONI OBIETTIVO MEDIO: 154 mg/dL (A1c: 7,0% o 53 mmol/mol)

A1c stimata 6,5% o 48 mmol/mol



The Effect of a Continuous Patient Monitoring System on Reducing Falls, Pressure Ulcers and Hospitalization in Skilled Nursing Facilities

A. Hassan - A. Sela

VATIKIM Geriatric center, Tel Aviv, Israel

Introduction

Background: In the skilled nursing facility, acute changes in condition can result in unplanned hospitalizations for the elderly, often due to falls with injury, or as the result of the onset of an acute medical illness. The introduction of new technological solutions that incorporate continuous vital sign monitoring and surveillance of patient activity in bed can be utilized to improve outcomes among the nursing home population.

Objective: To assess the effects of continuous monitoring in reducing hospitalizations of post-acute care residents in a skilled nursing facility. This was studied using Vitalerter, a contactless patient monitoring system that continuously transmits real-time information on pulse, respiratory rate, and level of activity in bed directly to the nursing staff, and instantly alerts when these values fall outside of pre-set parameters.

Methods

This study was conducted at the VATIKIM Geriatric Center, a 250-bed facility in Tel-Aviv Israel.
A 6 months monitoring period was compared to observe before-after outcome information.
Data on patients' falls, early diagnosis and treatment at the facility, and re-admissions to hospital rates, were collected.

Contactless sensors that monitor patient heart and respiratory rates, and in/out of bed status, were utilized.

All data was provided to caregivers on monitors and at the nursing station. Alerts regarding changes in vital signs or bed exit were transmitted to nurses for further assessment and intervention.

Results & Conclusions

We reviewed 64 patient records for our evaluation vs 64 checked before the test. The transfer rate to the hospital decreased by 38%, pressure ulcers decreased by 80% and the falls rate decreased by 56%.

Vatikim facility - Outcome data					
	Before evaluation		Evaluation (monitored patient)		Improvement %
# of Residents	64		64		
Men	28	54,4%	25	44.10%	
Women	36	45,6%	39	55.90%	
Age (Avg)	78		78		
Results					
Fall from bed	9	14.06%	4	6.25%	-56%
Pressure Ulcers	6	9.38%	1	1.56%	-83%
Readmission to Hospital	13	20.31%	8	12.50%	-38%

In this study, the implementation of Vitalerter, a continuous patient monitoring system has demonstrated **a significant decrease in the total number of falls, pressure ulcers and a trend towards reduction in the transfer rate to hospitals,** thus improving the overall quality of care for the elderly.

Eur J Cancer Prev. 2010 Sep;19(5):342-4. doi: 10.1097/CEJ.0b013e32833c1be0.

Variations in hemoglobin before colorectal cancer diagnosis.

Goldshtein I[1], Neeman U, Chodick G, Shalev V.

⊕ Author information

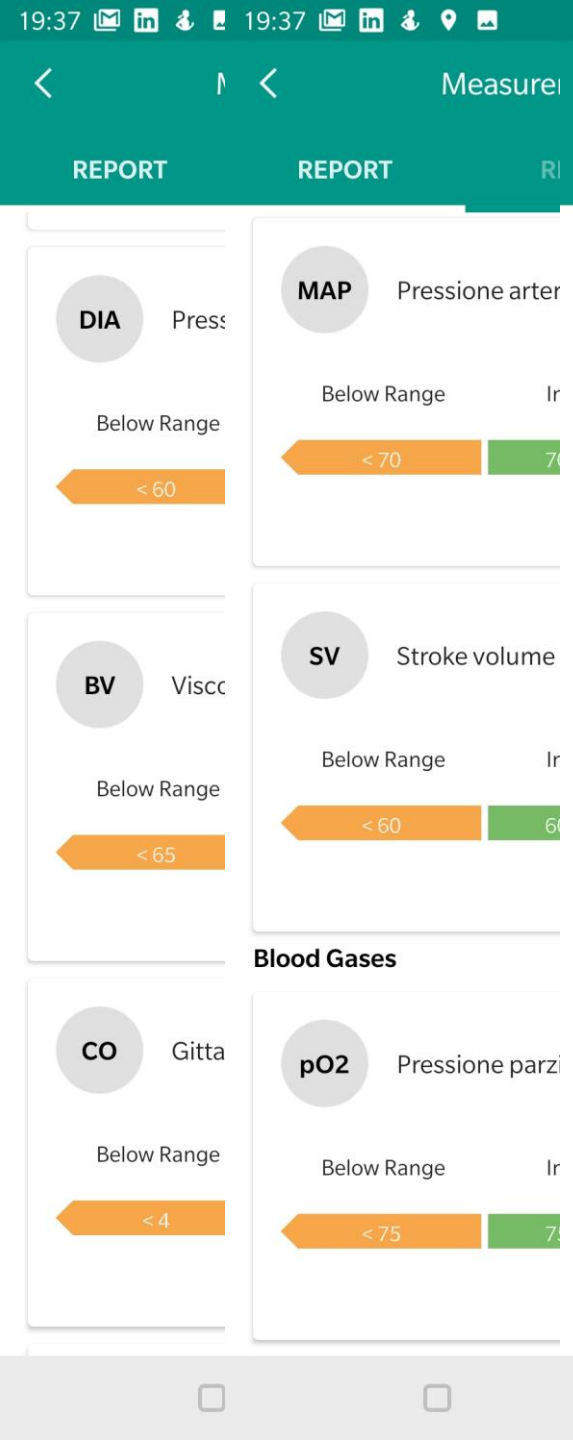
Abstract

We have conducted the present case-control study to examine whether long-term variations in blood hemoglobin (Hb) levels within the normal range could detect subtle gastrointestinal bleeding in the early development of colorectal cancer (CRC). A total of 1074 CRC cases aged 45-75 years that have been diagnosed with CRC and had normal Hb levels were frequency matched for age and sex with cancer-free individuals at a ratio of 10 controls per case. Our retrospective analysis indicates that starting from 4 years prior to cancer diagnosis, a progressive significant (P<0.001) decrement in Hb levels (0.28 g/dl per 6 months) was found among cases but not among controls. CRC patients were characterized in an on-going, long-term, logarithmic decrement in Hb levels. Such small changes within the normal Hb range could be missed by health providers, but automatically detected by computerized alert algorithms..

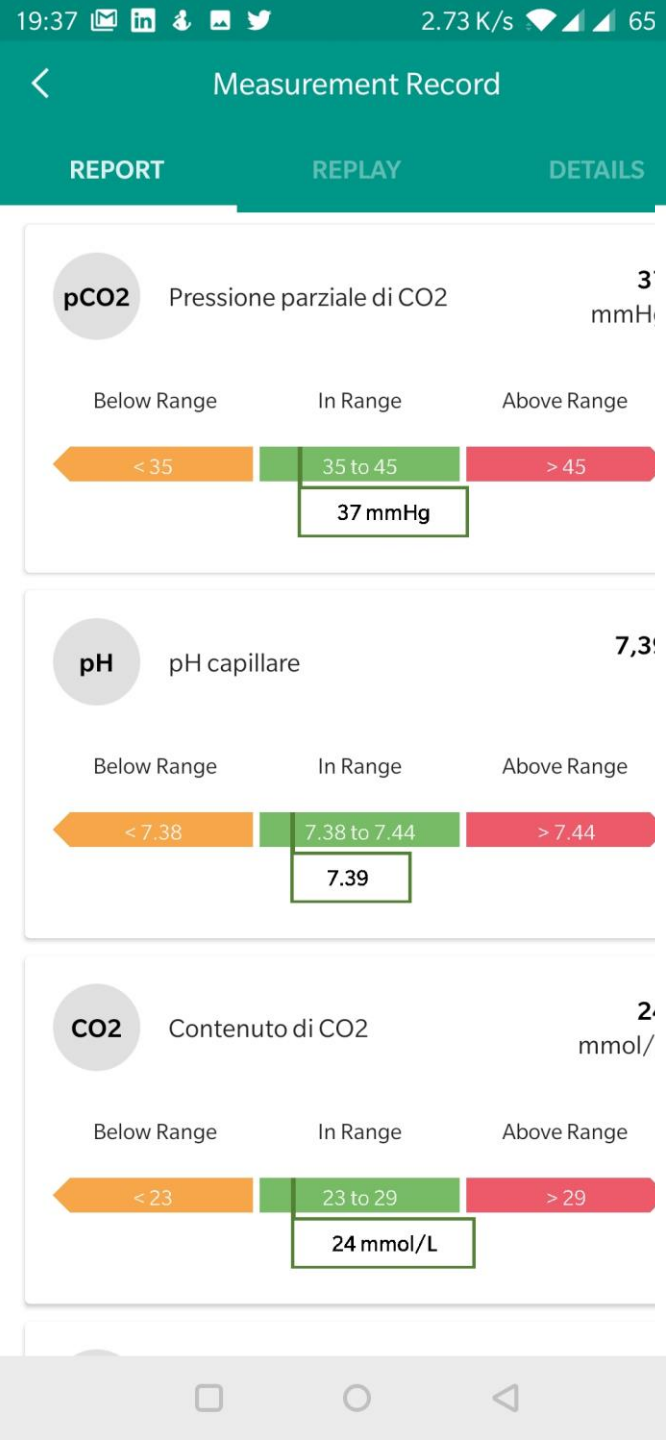
PMID: 20543703 DOI: 10.1097/CEJ.0b013e32833c1be0

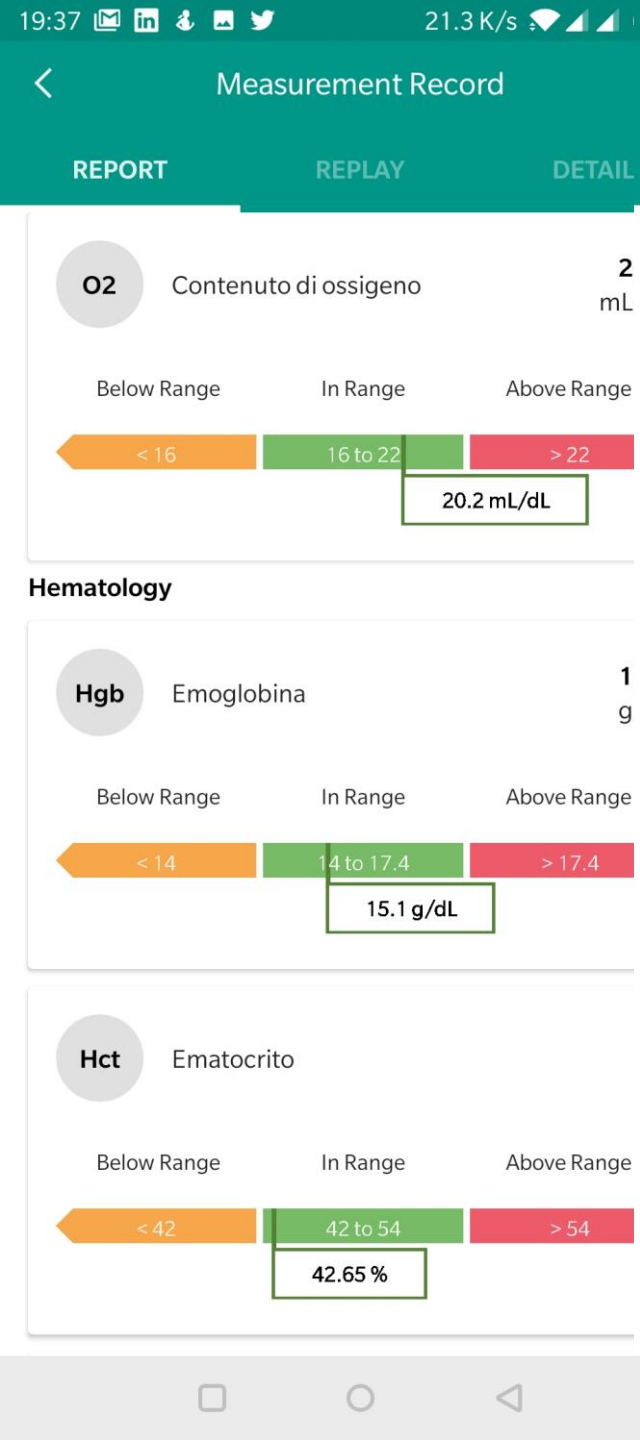
[Indexed for MEDLINE]

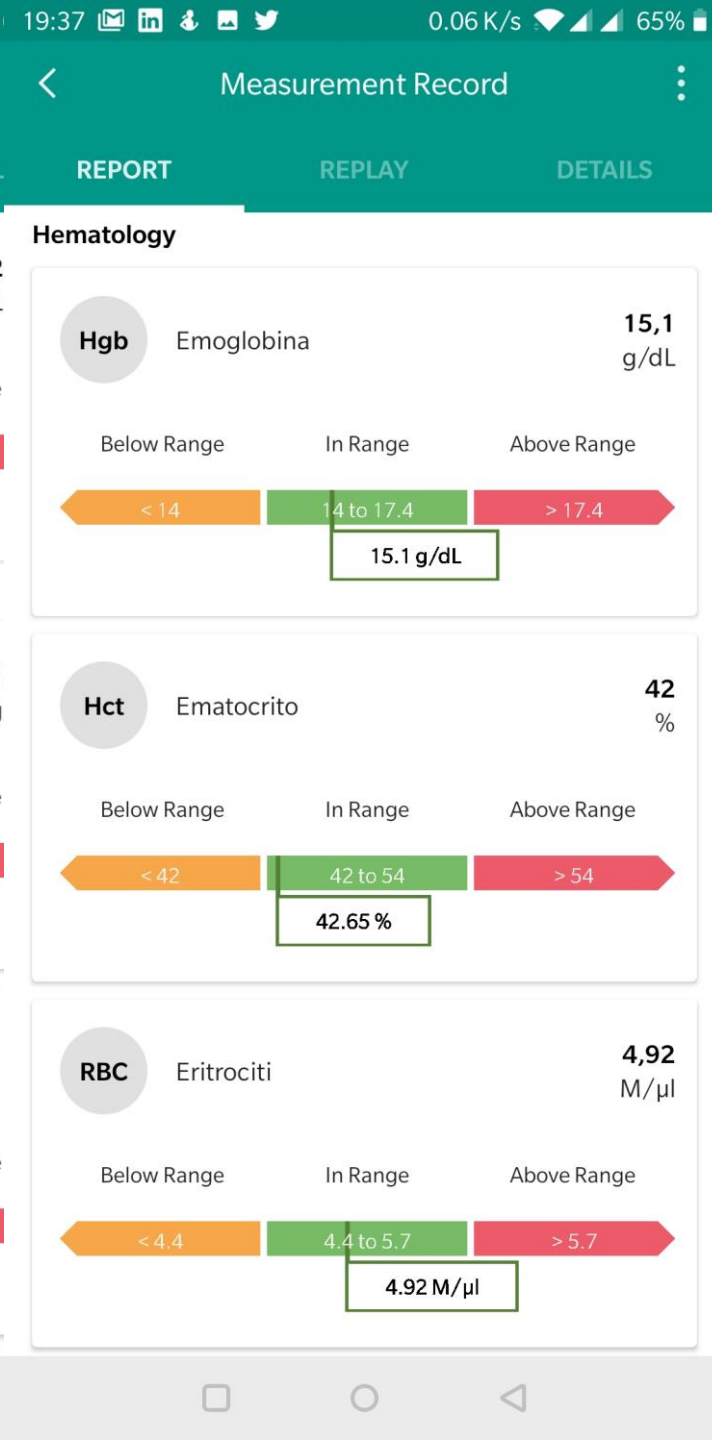
Nuovi device di telemonitoraggio forniscono parametri in modo non invasivo e continuo

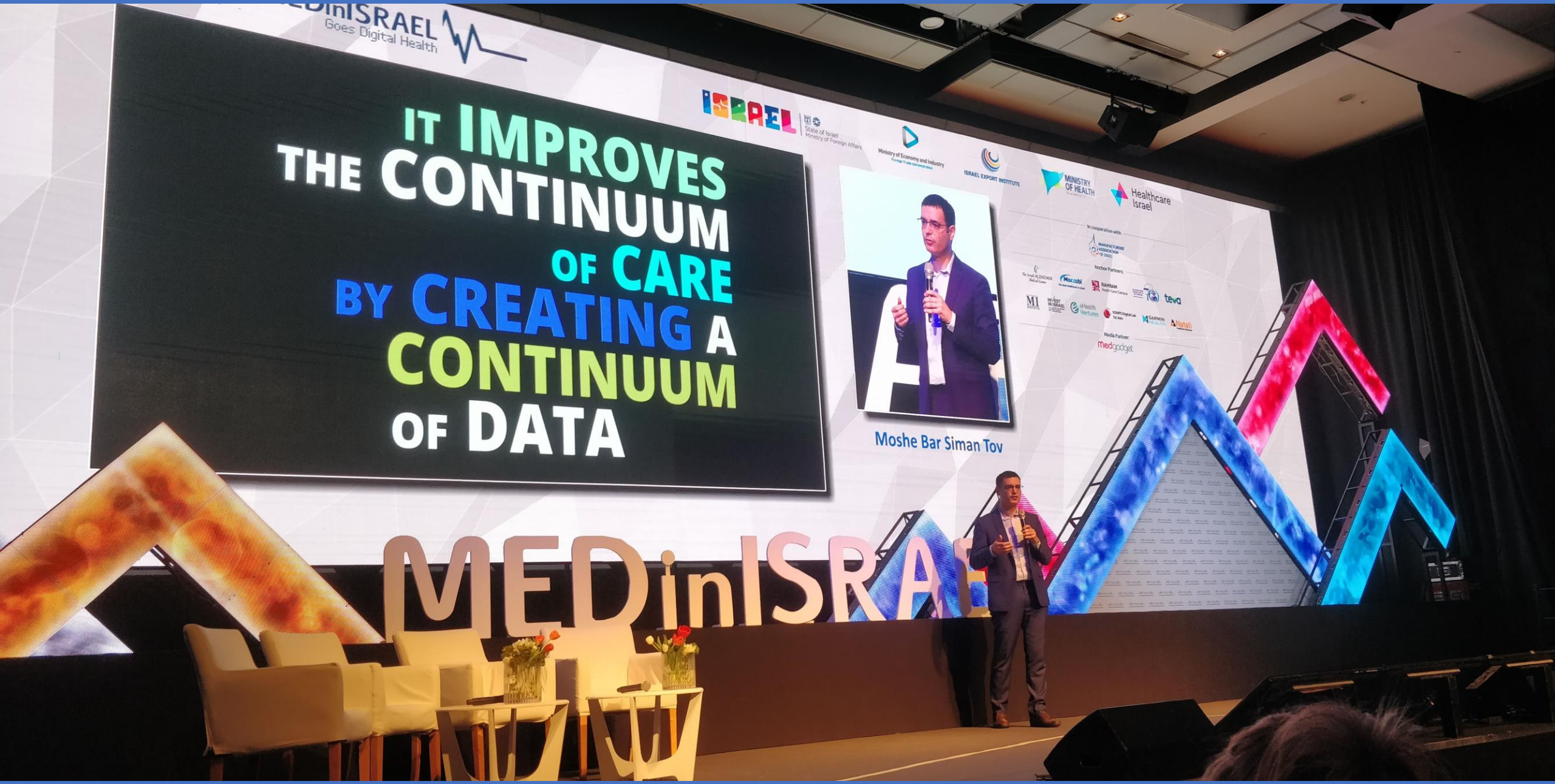

REPORT
DIA
Below Range
< 60
BV
Below Range
< 65
CO
Below Range
< 4

REPORT
MAP
Below Range
< 70
SV
Stroke volume
Below Range
< 60
Blood Gases
pO2
Below Range
< 75


Measurement Record
REPORT
REPLAY
DETAILS
pCO2
Pressione parziale di CO2
Below Range
In Range
Above Range
< 35
35 to 45
> 45
37 mmHg
pH
pH capillare
Below Range
In Range
Above Range
< 7.38
7.38 to 7.44
> 7.44
7.39
CO2
Contenuto di CO2
Below Range
In Range
Above Range
< 23
23 to 29
> 29
24 mmol/L


Measurement Record
REPORT
REPLAY
DETAIL
O2
Contenuto di ossigeno
Below Range
In Range
Above Range
< 16
16 to 22
> 22
20.2 mL/dL
Hematology
Hgb
Emoglobina
Below Range
In Range
Above Range
< 14
14 to 17.4
> 17.4
15.1 g/dL
Hct
Ematocrito
Below Range
In Range
Above Range
< 42
42 to 54
> 54
42.65 %


Measurement Record
REPORT
REPLAY
DETAILS
Hematology
Hgb
Emoglobina
15,1
g/dL
Below Range
In Range
Above Range
< 14
14 to 17.4
> 17.4
15.1 g/dL
Hct
Ematocrito
42
%
Below Range
In Range
Above Range
< 42
42 to 54
> 54
42.65 %
RBC
Eritrociti
4,92
M/µl
Below Range
In Range
Above Range
< 4.4
4.4 to 5.7
> 5.7
4.92 M/µl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IT IMPROVES
THE CONTINUUM
OF CARE
BY CREATING A
CONTINUUM
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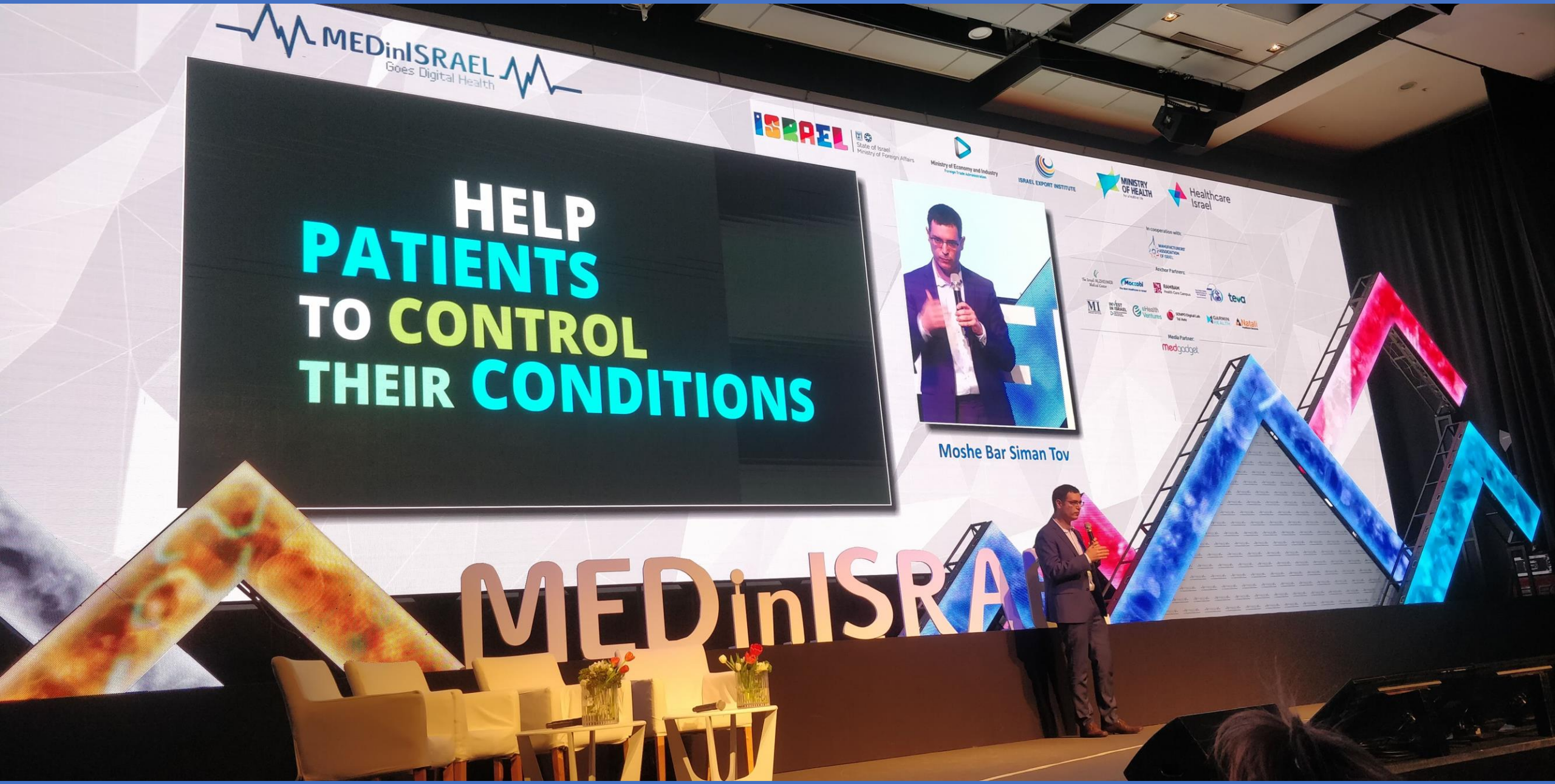
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HELP
PATIENTS
TO CONTROL
THEIR CONDITIONS
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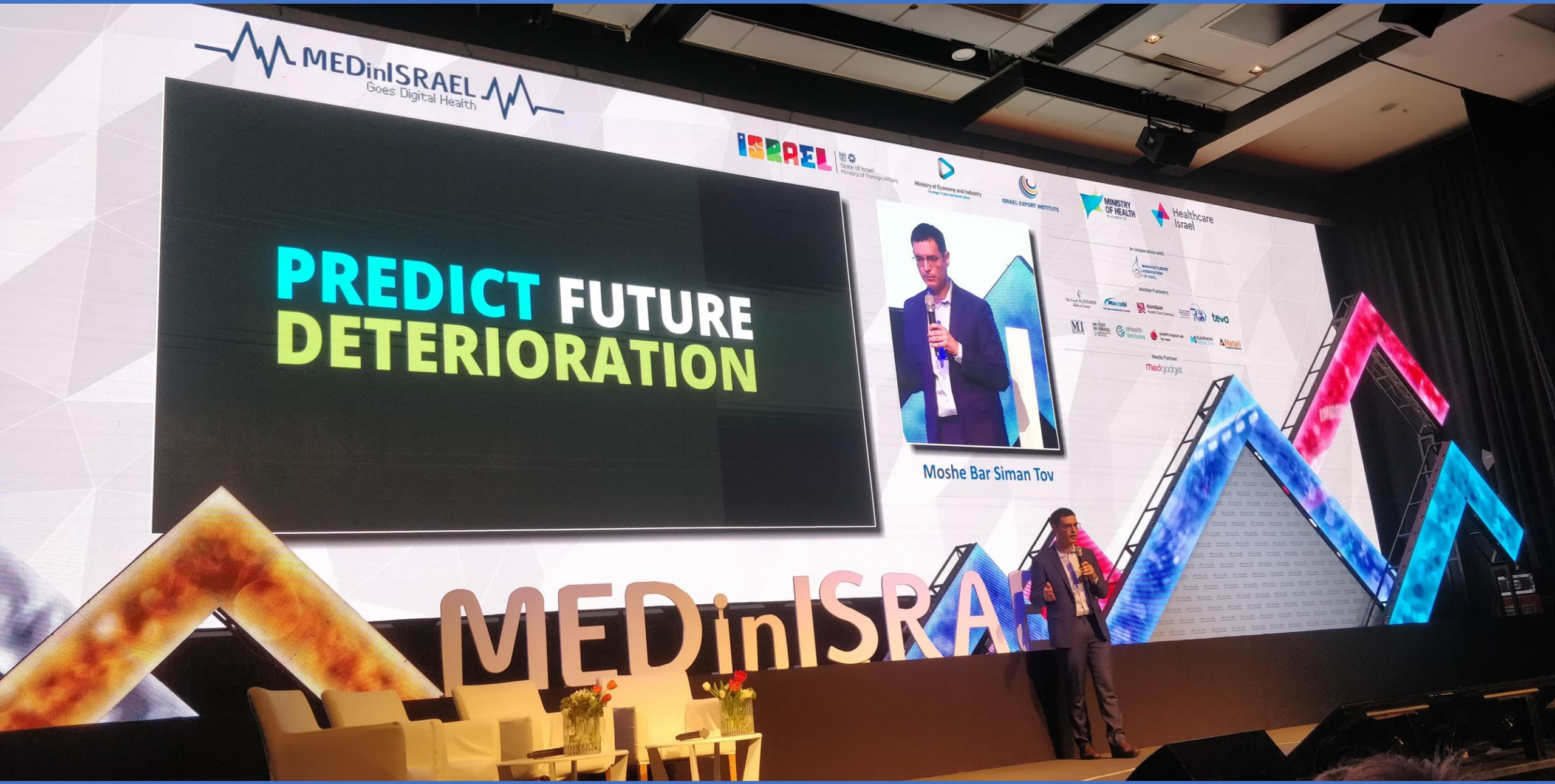
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DETERIORATION
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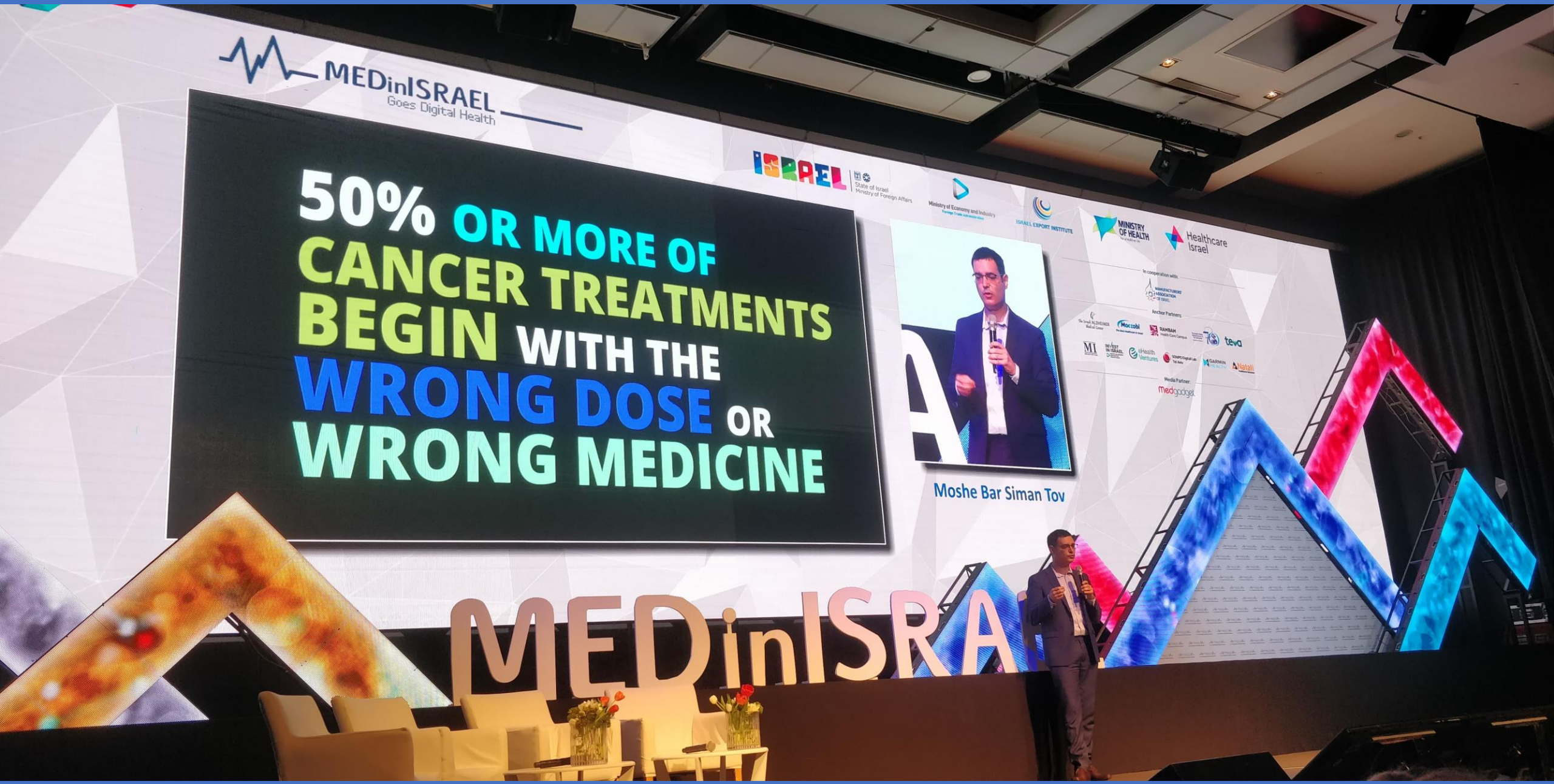
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50% OR MORE OF
CANCER TREATMENTS
BEGIN WITH THE
WRONG DOSE OR
WRONG MEDICINE
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Il Big Data in sanità non vuol dire solo dati sanitari

Sociale e sanitario, assieme, per supportale la FRAGILITA’; cronicità è un concetto ormai superato dall’evoluzione della medicina, siamo tutti cronici ma le priorità devono essere per i piu’ fragili

How Big Data Will Unlock the Potential of Healthcare

Big Data

Big data refers to the mass of structured and unstructured data generated worldwide.
In healthcare, this encompasses everything from electronic medical records,
to internet-connected (IoT) devices.

It spans four dimensions:

VOLUME

Life sciences/pharma businesses are awash with patient-related data of all types, every day.

***Artificial intelligence** enables healthcare providers to parse through large amount of data and perform complex analytical tasks quicker and with greater accuracy.*

VELOCITY

*Waiting for answers from data troves tends to slow things down in a **time-sensitive industry.***

To maximize the value of big data, meaningful insights must be extrapolated as it streams in.

VERACITY

*Establishing **trust and accuracy** in big data is imperative in the healthcare industry.*

Data assurance includes guaranteeing that data analytics are error-free and credible.

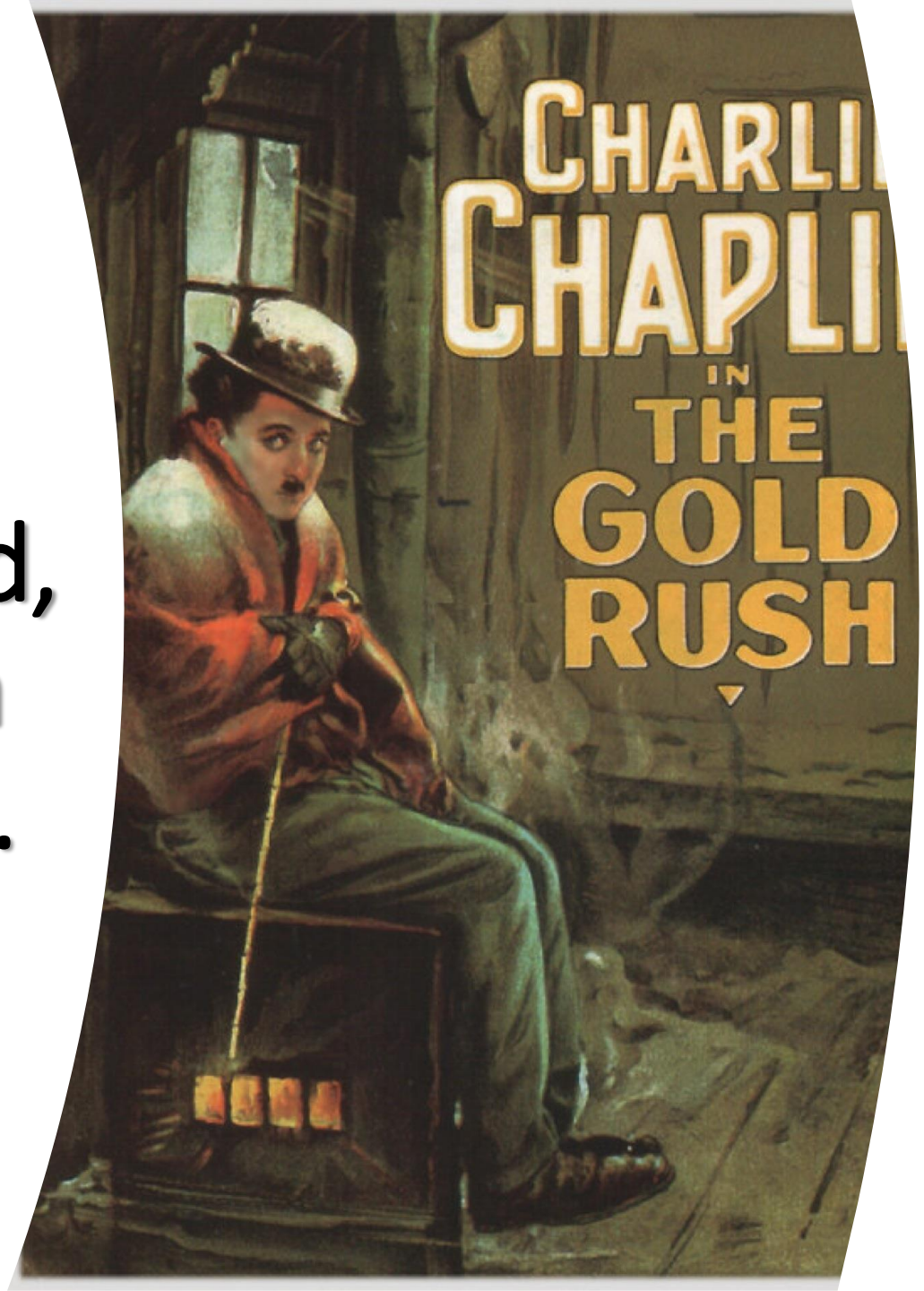
VARIETY

*Big data comes from a myriad of sources, such as **IoT devices and social media.***

New and actionable insights can be found when various data types are analyzed together.

Source: IBM Industry Insights, Razorfish

Lesson Learned, la corsa all'oro…



- Arrivano i cercatori…poi
- Arrivano i fornitori…poi
- Arrivano le banche…poi

Chi è si è arricchito?

Grazie

s.pillon@scf.gov.it