

**PUBLIC HEALTH SCHWEIZ  
SANTÉ PUBLIQUE SUISSE  
SALUTE PUBBLICA SVIZZERA**

The Swiss Society for Public Health



[christian.lovis@hcuge.ch](mailto:christian.lovis@hcuge.ch)

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14.45 – 15.05

**Keynote Lecture 1: Mehr Daten, mehr Sicherheit?**

**Prof. Dr. med. Christian Lovis**, Chefarzt Medical Information Sciences,  
Hôpitaux Universitaires de Genève (HUG)

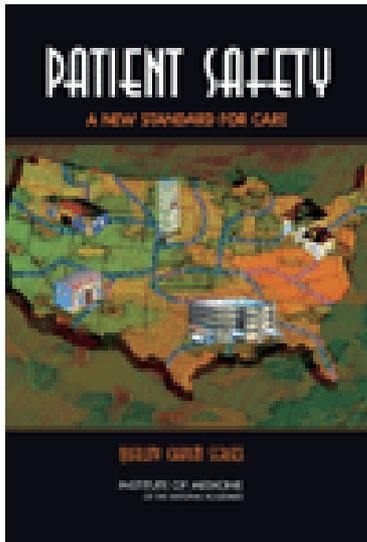
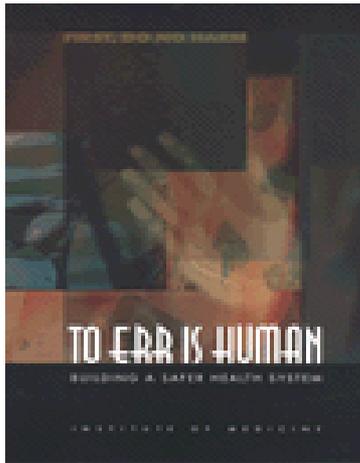
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Medecin	Médicament	Voie d'administration
1.	albacortene	i.t. 25mg
2.	Proc-1 (Cytosar)	i.t. 40mg
3.	Méthotrexate	i.t. 12.5mg
4.		
5.		

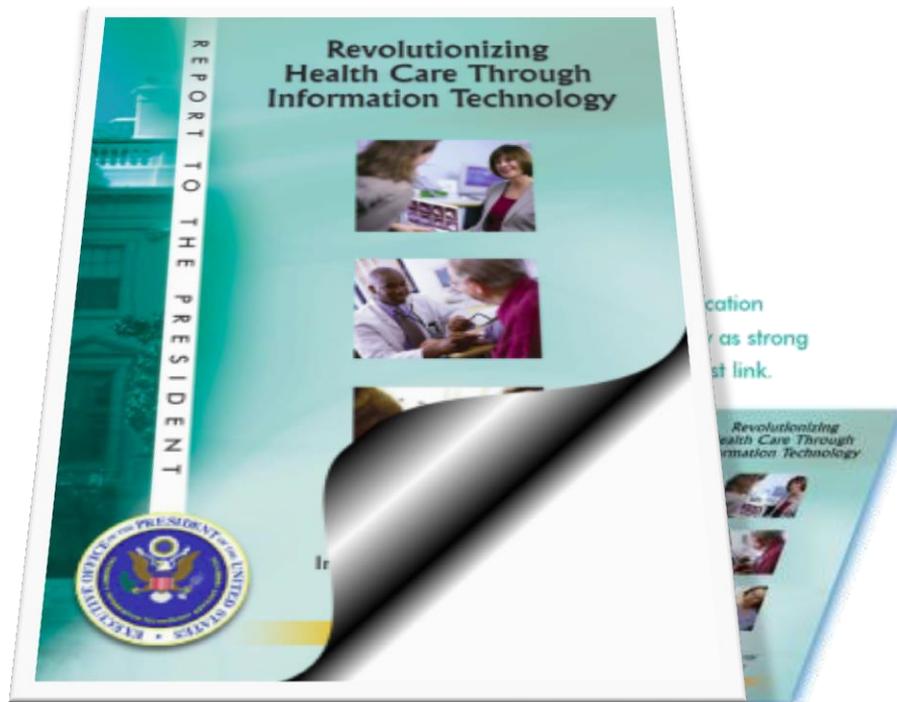
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- under-use, overuse, misuse of the health care system...
  - IOM Roundtable on Quality (JAMA 1998)
- “To Err is Human”: building a safer Health System
  - 2,9-3,7% inpatients have complications
  - 6.6-13.6% lead to death, 50% evitable
  - 8th mortality cause in the USA
  - drug errors > 7'000 death/y in the USA
  - (workers: 6'000)



## ITAC report to Bush

education  
 as strong  
 link.

Research on the use of IT to improve the workflow for health care delivery functions is a particularly inviting target.

Standardized clinical vocabulary is essential to computerized decision-support tools using sharable protocols that lower error rates and improve the quality of health care.



...the potential of IT to improve the delivery of care while reducing costs is enormous...

...the most remarkable feature of this twenty-first century medicine is that we hold it together with nineteenth-century paperwork<sup>1</sup>

**FINDINGS AND RECOMMENDATIONS.....10**

**PART I – PROMOTING THE ELECTRONIC HEALTH RECORD, CLINICAL DECISION SUPPORT,  
AND COMPUTERIZED PROVIDER ORDER ENTRY ..... 10**

- 1. *Economic Incentives for Investment in Health IT..... 10*
- 2. *Health Information Exchange..... 11*
- 3. *Facilitating the Sharing of EHR Technologies..... 12*
- 4. *Leveraging Federal Health IT Investments ..... 13*
- 5. *Implementing a Standard Clinical Vocabulary ..... 14*
- 6. *Standardized, Interoperable EHRs ..... 17*
- 7. *The Human-Machine Interface and EHRs..... 18*
- 8. *Coordination of Federal NHII Development and Implementation..... 20*

**PART II – PROMOTING SECURE, PRIVATE, INTEROPERABLE HEALTH INFORMATION  
EXCHANGE ..... 21**

- 9. *Unambiguous Patient Identification ..... 21*
- 10. *Public Key Encrypted Internet Communications ..... 22*
- 11. *Trust Hierarchy and Authentication..... 23*
- 12. *Tracing Access Requests ..... 24*

# Clinical Information Technologies and Inpatient Outcomes

## A Multiple Hospital Study

Ruben Amarasingham, MD  
Darrell J. Gaskin, PhD; N

**Background:** Despite the use of clinical information technologies to improve patient outcomes, few studies have examined their impact in a large number of hospitals.

**Methods:** We conducted a study of 140 urban hospitals in Texas. We assessed each hospital's Technology Assessment and Monitoring System (TAM) level of automation and compared it with the information system's impact on potential confounders, we examined the impact of automation of hospital information systems on reduced rates of inpatient mortality and length of stay for 167 medical conditions admitted to responding hospitals between 2005, and May 30, 2006.

**Results:** We received a sufficient number of responses from 41 of 72 hospitals (58%). For all medical conditions studied,

**Results:** We received a sufficient number of responses from 41 of 72 hospitals (58%). For all medical conditions studied, a 10-point increase in the automation of notes and records was associated with a 15% decrease in the adjusted odds of fatal hospitalizations (0.85; 95% confidence interval, 0.74-0.97). Higher scores in order entry were associated with 9% and 55% decreases in the adjusted odds of death for myocardial infarction and coronary artery bypass graft procedures, respectively. For all causes of hospitalization, higher scores in decision support were associated with a 16% decrease in the adjusted odds of complications (0.84; 95% confidence interval, 0.79-0.90). Higher scores on test results, order entry, and decision support were associated with lower costs for all hospital admissions (-\$110, -\$132, and -\$538, respectively;  $P < .05$ ).

**Conclusion:** Hospitals with automated notes and records, order entry, and clinical decision support had fewer complications, lower mortality rates, and lower costs.

*Arch Intern Med.* 2009;169(2):108-114

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*Arch Intern Med.* 2009;169(2):108-114

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Hospitals with automated notes and records, order entry, and clinical decision support had fewer complications, lower mortality rates, and lower costs.

## Pregnancy Complicating Diabetes\*

PRISCILLA WHITE, M.D.  
Boston, Massachusetts

**D**URING the past fifteen years a study has been made at the George F. Baker Clinic of the New England Deaconess Hospital to determine possible causes and the means to prevent the high fetal wastage in diabetic pregnancies. The following report is a summary of the experiences with 439 viable diabetic pregnancy cases in which assays for one or more of the sex hormones of pregnancy were determined. Viability in the infant was defined by weight, namely, in excess of 960 Gm. This series of 439 includes all consecutive cases under personal observation. Excluded from the report are consultation cases treated elsewhere and patients reporting to the clinic for delivery but arriving too late for significant studies for sex hormone excretion.

The series appears to be unique because it is characterized by the number of primiparae, the number of patients in whom the onset of diabetes occurred in childhood and youth and those in whom the duration of diabetes is long. Primiparae numbered 57 per cent of the series. The onset of diabetes had occurred under the age of twenty years in more than half (58 per cent) and the duration was long, exceeding ten years in 50 per cent.

Although maternal mortality was low, for there was only one death or a case mortality of 0.2 per cent, fetal fatalities numbered 78, or 18 per cent. The maternal death was technically so classified only. It occurred fifty days after delivery and was proved by autopsy to be due to infectious hepatitis. These vital statistics as well as those reported elsewhere indicate that fetal not maternal survival constitutes the problem when pregnancy complicates diabetes.

\* From the George F. Baker Clinic, New England Deaconess Hospital, Boston, Mass.

Abnormalities in the obstetric course were common and included eclampsia four times (1 per cent); an additional seventy-six patients (17 per cent) had hypertension and albuminuria; eighty (18 per cent) had hypertension alone and thirty-four (8 per cent) albuminuria alone. Nearly one-half the number thus had evidence of hypertensive disorders or renal disease. Placenta previa occurred once; premature rupture of membranes before the twentieth week with continuous loss of amniotic fluid for weeks and months occurred four times. Two other deviations from normal obstetric courses were frequently seen, namely, irritability of the uterus and hydramnios. These complications occurred in varying degrees in nearly all patients.

Diabetic crises, on the other hand, were infrequent. Coma, defined as a lowering of the CO<sub>2</sub> content of the blood to 9 m.Eq., occurred in eight patients only, or 2 per cent, and hypoglycemia of severity in four, or 1 per cent.

The fetal fatalities are summarized in Table I. Of the seventy-eight fetal deaths, thirty-four were stillbirths and forty-four occurred in the early neonatal period. From Table I it appears that fetal fatalities have been influenced in varying degrees by (1) poor control of maternal diabetes, (2) the occurrence of congenital fetal defects, (3) the degree of maternal vascular disease, (4) prematurity, (5) duration of diabetes, (6) its age of inception and (7) the imbalance of the sex hormones of pregnancy.

Diabetic coma which may be taken as the measure of the maximum degree of poor control of diabetes coincided with 5 per cent of the fetal fatalities. Indeed, only two infants in this series survived a bout of dia-



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TABLE IV  
SEX HORMONAL THERAPY IN MG. OF STILBESTROL AND  
PROLUTON ACCORDING TO WEEKLY PREGNANCY  
AND CLINICAL CLASSIFICATION

Week of Pregnancy	Stilbcstrol and Proluton in mg. According to Class			
	A	B and C	D	E and F
6-19	0	5	10	25
20-23	0	5	10	25
24-27	0	5	10	25
28-31	0	5	10	25
32 and up	0	50	75	25

# Stilboestrol

1: [N Engl J Med.](#) 1971 Apr 15;284(15):878-81.

1971

Comment in:

[Obstet Gynecol.](#) 2003 Aug;102(2):222.

Adenocarcinoma of the vagina. Association of maternal stilbestrol therapy with tumor appearance in young women.

[Herbst AL](#), [Ulfelder H](#), [Poskanzer DC](#).

1: [Br Med J.](#) 1978 Jun 17;1(6127):1500-00

1978

Stilboestrol and vaginal clear-cell adenocarcinoma syndrome.

[Monaqhan JM](#), [Sirisena LA](#).

A vaginal clear-cell adenocarcinoma developed in a young woman who had been exposed in utero to maternal stilboestrol treatment. During 1940-71 in the UK some 7500 women were given stilboestrol during pregnancy. Thus more cases are likely to appear and clinicians caring for young women should be alert to this possibility.

Les Lettres aux prescripteurs

**Mise au point sur le diéthylstilbestrol (D.E.S.) (Distilbène®, Stilboestrol-Borne®)  
et le risque de complications génitales et obstétricales**

mise à jour : janvier 2003

Le diéthylstilbestrol (D.E.S), oestrogène de synthèse non stéroïdien a été utilisé en France entre 1948 et 1977 chez les femmes enceintes pour prévenir les avortements spontanés et les hémorragies gravidiques. Il a été commercialisé en France à partir de 1948 sous les noms de spécialités Distilbène®, Stilboestrol-Borne®.

C'est aux USA en 1971 que les premiers cas de cancers du vagin chez des jeunes filles qui avaient été exposées in utero au D.E.S. ont attiré l'attention. Un des premiers cas français d'adénocarcinome vaginal chez une jeune fille a été publié en 1975. En France, l'indication " avortements spontanés à répétition " a été supprimée en 1976 et la contre-indication d'utilisation chez la femme enceinte a été ajoutée en 1977.

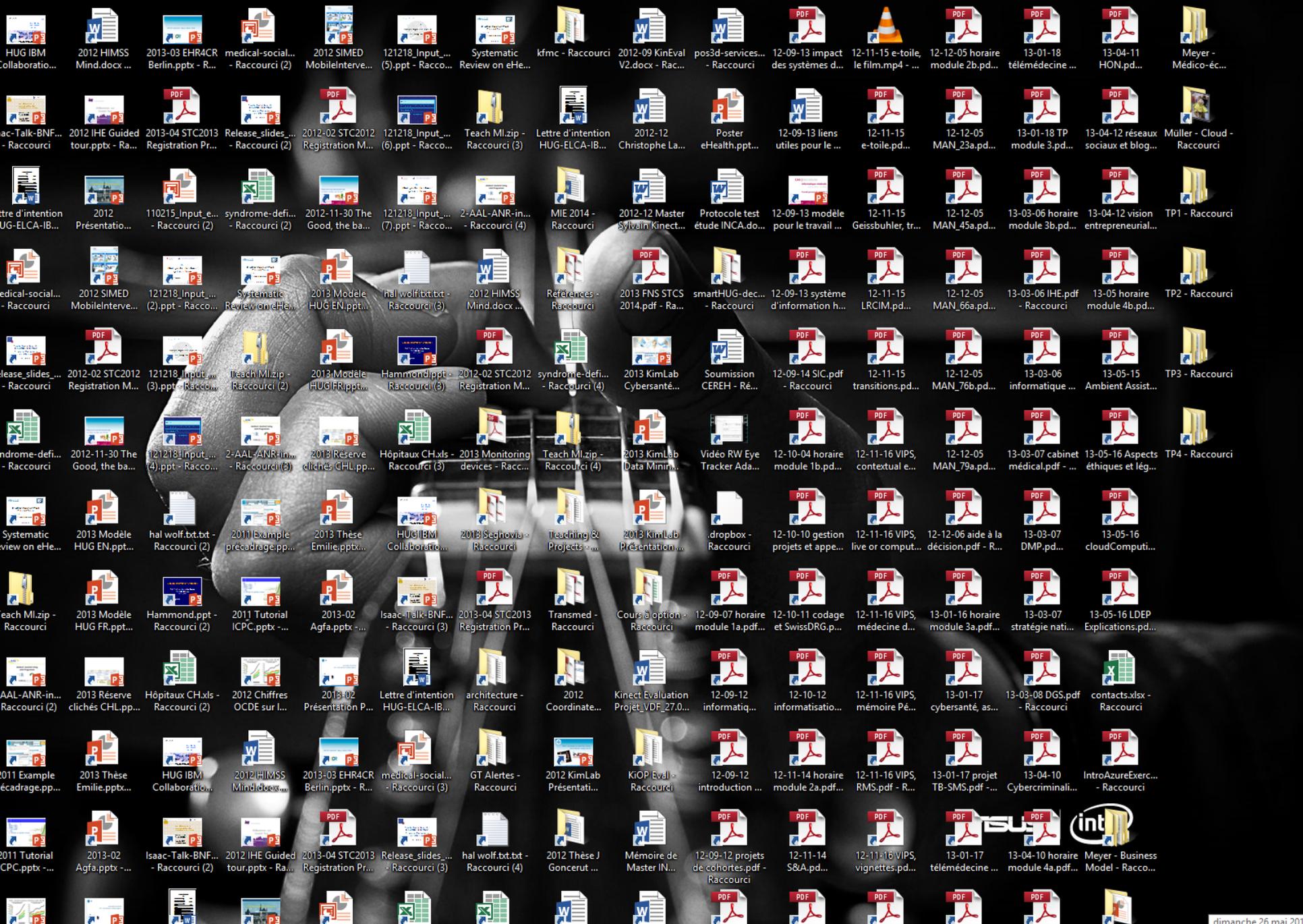
Depuis, d'autres complications génitales et obstétricales de l'exposition au D.E.S. pendant la grossesse ont été observées chez les enfants exposés in utero et ont fait l'objet d'informations successives, notamment par la diffusion de brochures informatives destinées aux professionnels de santé puis au public.

Ce problème reste d'actualité et ce probablement pour plusieurs années encore. En effet, entre les années 1948 et 1976, environ 200 000 femmes ont été traitées par D.E.S. pendant leur grossesse en France. En tenant compte des avortements et de la mortalité fœtale et néonatale, le nombre d'enfants nés de ces grossesses est estimé à 160 000 (soit 80 000 filles et 80 000 garçons exposés in utero). Le pic de prescription est situé à la fin des années 1960 et au début des années 1970. Les patients exposés in utero ont donc aujourd'hui un âge compris entre 25 ans et 52 ans. Les effets sur la 2ème génération en terme de conséquences obstétricales pourront donc être observés jusque dans les années 2015.

A ce jour il apparaît que seule une partie du corps médical connaît les conséquences de l'exposition in utero au D.E.S. C'est pourquoi l'Agence Française de Sécurité Sanitaire des Produits de Santé (Afssaps) a décidé d'informer les professionnels de santé sur les modalités de dépistage et de prise en charge de ces patients. Cette mise au point a été préparée avec la coopération de l'Association Réseau D.E.S. France.

Actuellement le diéthylstilbestrol reste commercialisé sous le nom de Distilbène® dans l'indication de certaines pathologies prostatiques, uniquement.





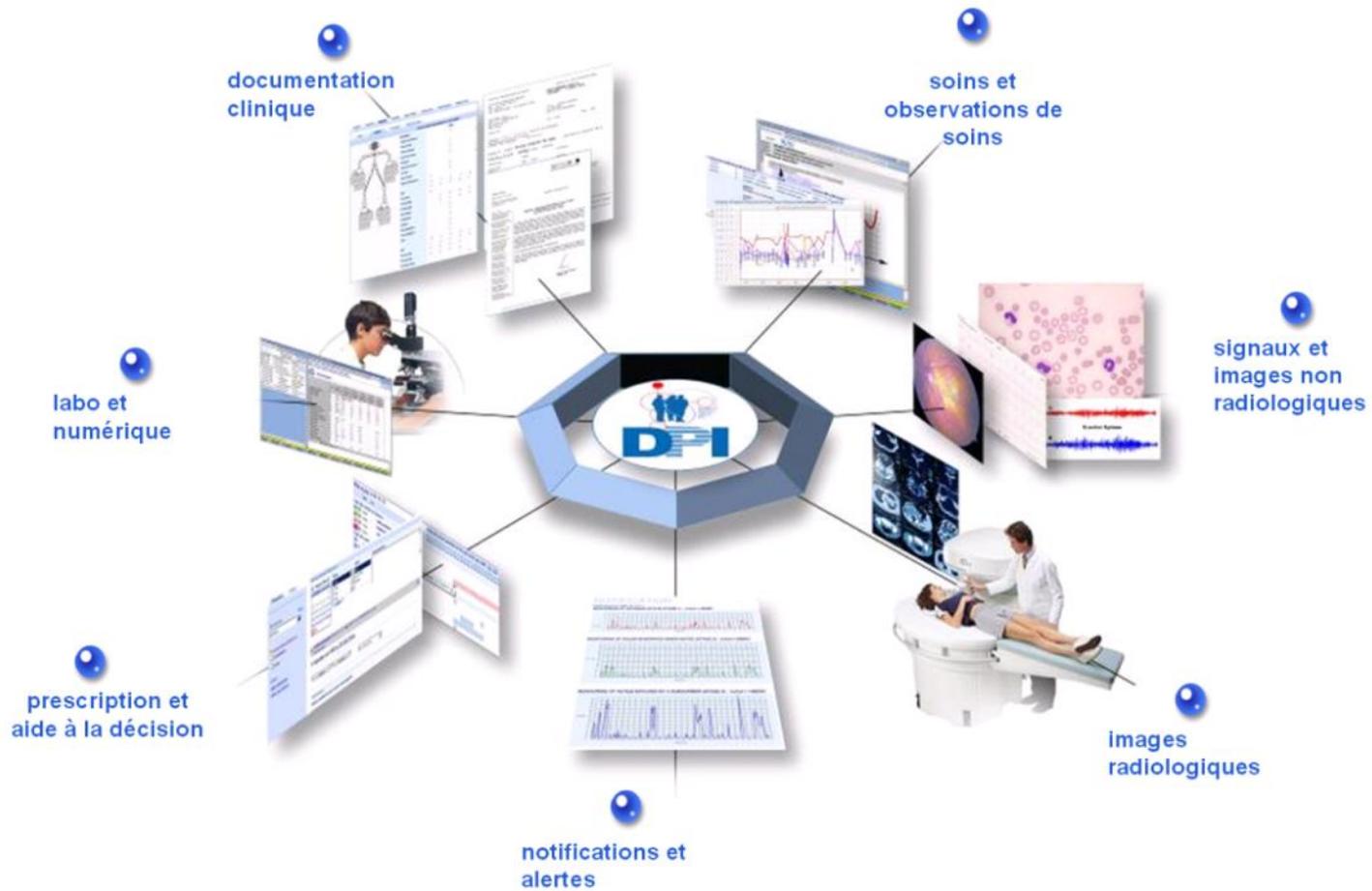
# Garbage in, garbage out

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From Wikipedia, the free encyclopedia

(Redirected from [GIGO](#))

**Garbage in, garbage out** (**GIGO**) in the field of [computer science](#) or [information and communications technology](#) refers to the fact that [computers](#) will unquestioningly process unintended, even nonsensical, input data ("garbage in") and produce undesired, often nonsensical, output ("garbage out").



# there is no interoperability without semantics

## Senate Committee Requests ONC Report on EHR Interoperability

Monday, July 28, 2014



Last week, the Senate Appropriations Committee in a draft bill requested that the Office of the National Coordinator for Health Information Technology (ONC) and the Health IT Policy Committee submit a report on the barriers to electronic health record interoperability, *Health Data Management* reports.

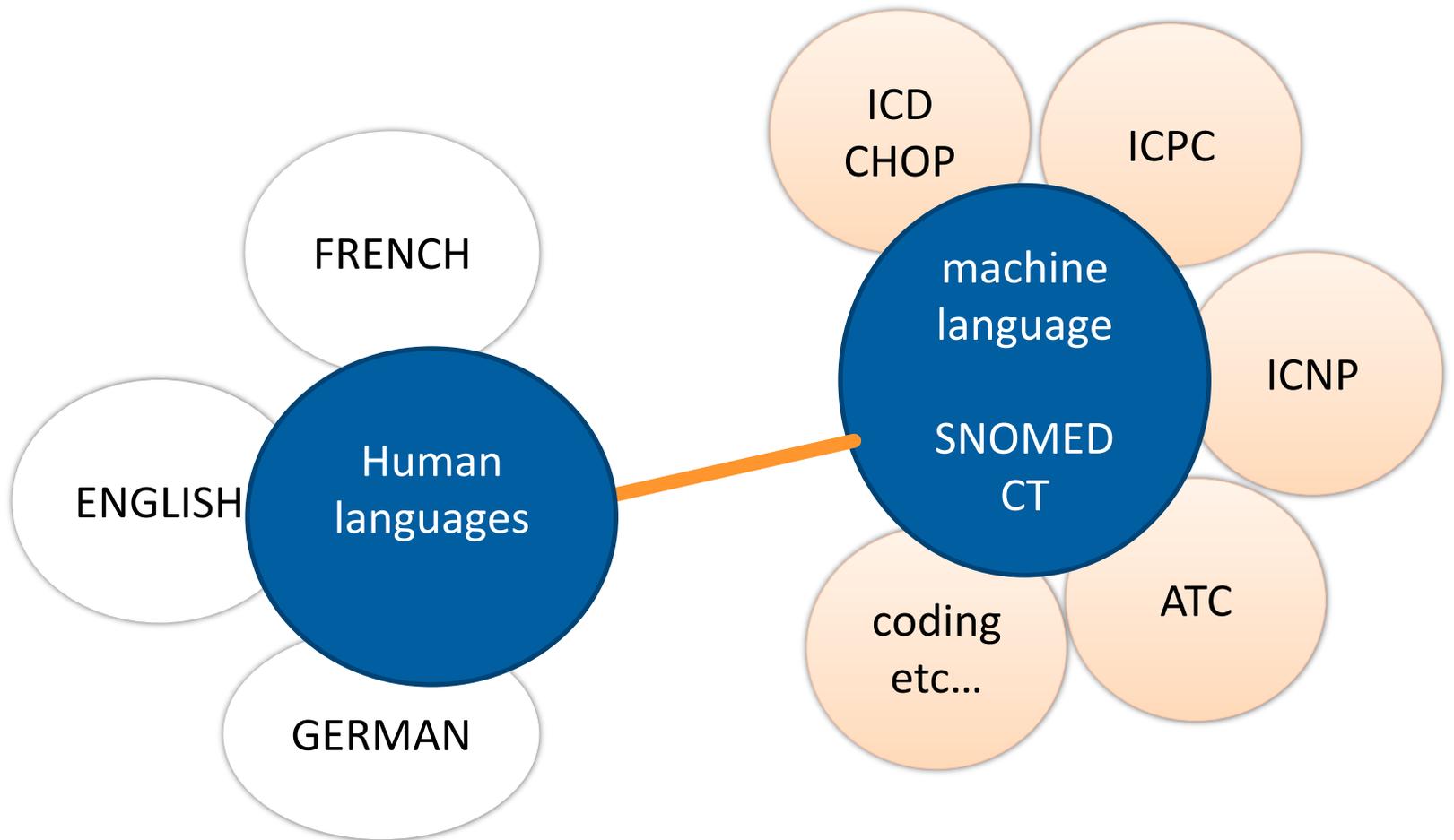
### Background

The draft bill follows the [release of a report](#) compiled by a task force assembled by the MITRE Corporation that found meaningful use stages 1 and 2 fall short of implementing the EHR interoperability necessary to facilitate information exchange and develop a robust health data infrastructure (Slabodkin, *Health Data Management*, 7/28).

#### RELATED TOPICS:

- Meaningful Use
- ONC







# ARTEMIS

## DebugIT Antimicrobial Resistance Trend Monitoring System

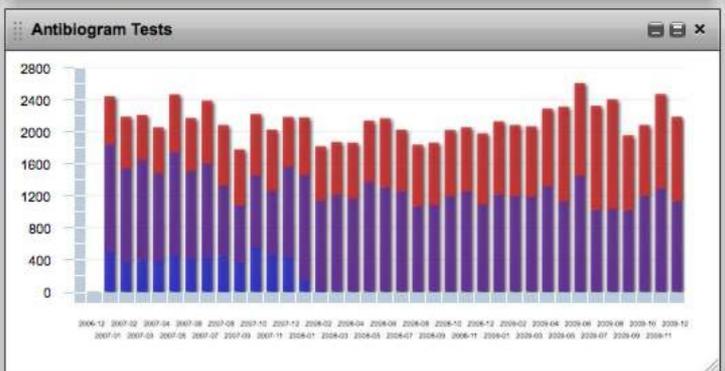
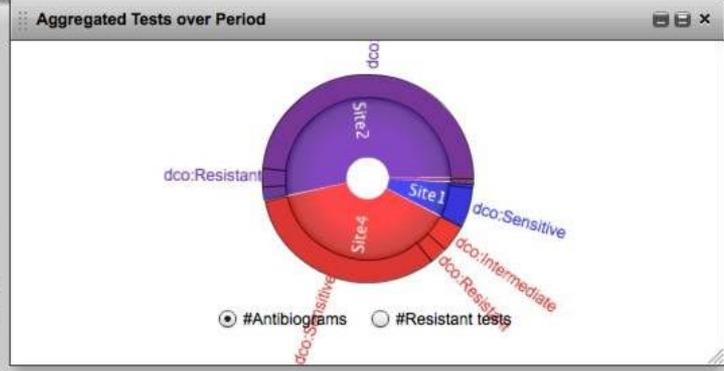
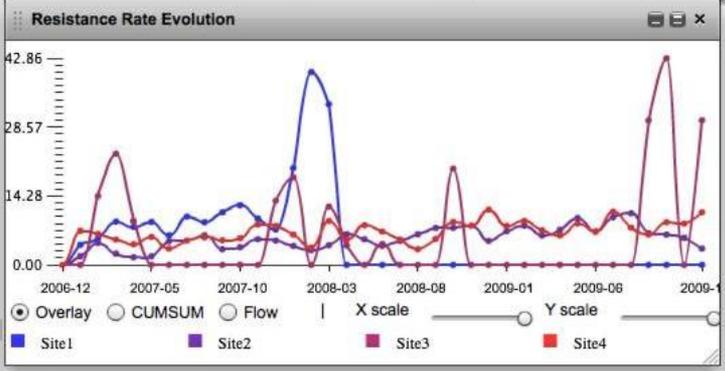
**Ontology Data Values**

- active\_ingredient
  - antibiotic
    - aminoglycoside
    - betalactam antibiotic
      - aztreonam
      - carbapenem
      - cephalosporin
        - 3rd generation
          - cefactor
          - cefadroxil
          - cefaloridine
          - cefalotin
          - cefalotin sodium
          - cefazolin
          - cefoperazone
          - cefotetan
          - cefotiam
          - cefoxitin
          - cefpime
          - cefprozil
          - cefsulodin

**Id:**  
<http://publ.org/impl/dco/dco#3rdGen>  
**Label**  
 3rd generation cephalosporin

Antibiogram View | Culture View | Treatment View | **Export** |  JPG  CSV | Period: Monthly | **Query**

What is the evolution of resistance to **3rd generation cephalosporin** of **escherichia coli** cultured from **sample\_origin** extracted from **gender** patients at **Site1, Site2, Site3** during period **2007-01-01** - **2009-12-31** ?

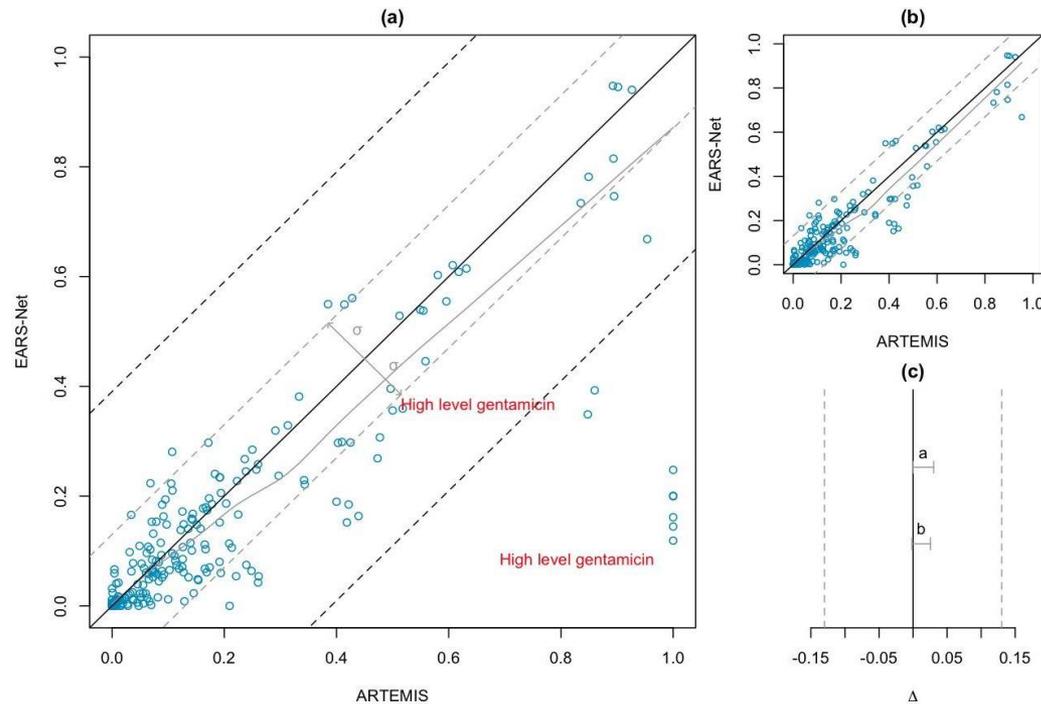


**Resistant Test Stats**

ClinicalSetting	Mean	Max	Min	StdDev
Site1	8.87	40.00	0.00	10.61
Site2	5.53	10.70	1.58	2.24
Site3	6.49	42.86	0.00	10.99
Site4	7.23	11.46	0.00	2.37

# DebugIT vs EARS-Net

European Antimicrobial Resistance Surveillance Network (EARS-Net)



Gray dashed lines indicate  $\Delta = \pm 0.130$

Gray horizontal bars indicate two one-sided convolution confidence interval (CI). 95% CIa 0–0.030 ( $P < .001$ ); 95% CIb 0.002–0.026 ( $P < .001$ ).

[J Med Internet Res.](#) 2012 May 29;14(3):e73. doi: 10.2196/jmir.2043.

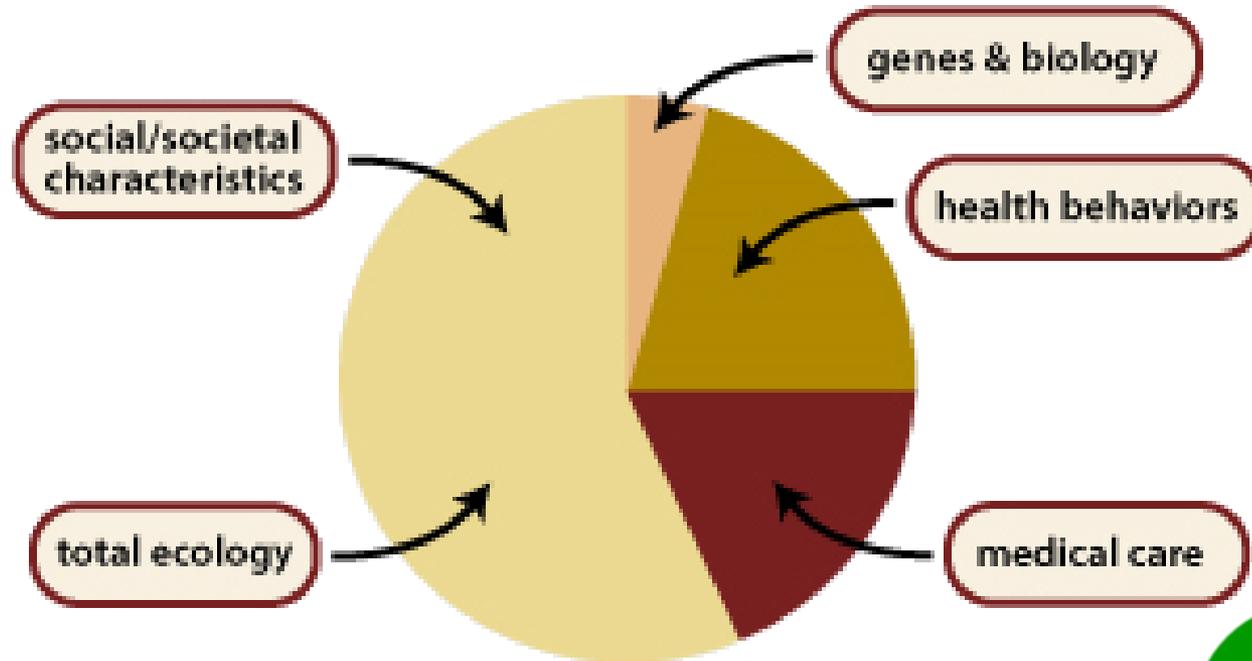
## Building a transnational biosurveillance network using semantic web technologies: requirements, design, and preliminary evaluation.

Teodoro D, Pasche E, Gobeill J, Emonet S, Ruch P, Lovis C.

University Hospitals of Geneva, Switzerland. [douglas.teodoro@hcuge.ch](mailto:douglas.teodoro@hcuge.ch)

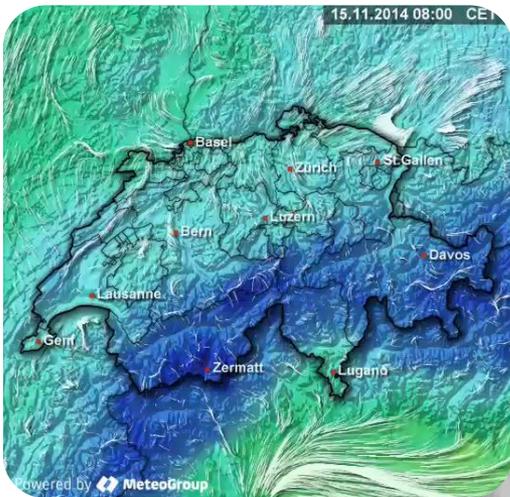
Abstract

# DETERMINANTS OF POPULATION HEALTH



Tarlov, A.R., Public Policy Frameworks for Improving Population Health. Annals of the New York Academy of Sciences, 1999. 896(SOCIOECONOMIC STATUS AND HEALTH IN INDUSTRIAL NATIONS: SOCIAL, PSYCHOLOGICAL, AND BIOLOGICAL PATHWAYS): p. 281-293.





# ANCE

cs making sense

## BIG DATA

SPECIAL ISSUE

### DATA AND THE CITY

WHO ARE YOUR  
NEIGHBOUR FRIENDS?

THE DATA FAMILY  
WHEN EVERY  
ACTION IS RECORDED.

This block contains the top portion of a magazine spread. It features the word 'ANCE' in large letters, followed by 'cs making sense'. Below that is 'BIG DATA SPECIAL ISSUE' and 'DATA AND THE CITY'. Two sub-articles are listed: 'WHO ARE YOUR NEIGHBOUR FRIENDS?' and 'THE DATA FAMILY WHEN EVERY ACTION IS RECORDED.' The background shows a stylized cityscape.

# The Economist

## The data deluge

AND HOW TO HANDLE IT: A 14-PAGE SPECIAL REPORT

This block shows the cover of 'The Economist' magazine. The title 'The Economist' is at the top. The main headline is 'The data deluge' with a subtitle 'AND HOW TO HANDLE IT: A 14-PAGE SPECIAL REPORT'. Below the text is a black and white illustration of a man in a suit holding a large umbrella, standing in the rain. The background has a grid pattern.



# DATA

NATUREJOBS  
Minnesota musings

This block shows a graphic with the word 'DATA' in large, bold, white letters. Below it, there is a smaller graphic of a keyboard and the text 'NATUREJOBS Minnesota musings'.

# POPULAR SCIENCE

This block contains the text 'POPULAR SCIENCE' in large, bold, white letters, likely serving as a background or header for the lower section of the collage.

# Harvard Business Review

## GETTING CONTROL OF BIG DATA

This block shows the cover of 'Harvard Business Review' magazine. The title 'Harvard Business Review' is at the top. The main headline is 'GETTING CONTROL OF BIG DATA'. Below the text is a black and white illustration of a person running while carrying a laptop. The background is light gray.

# Government Executive

## BIG DATA

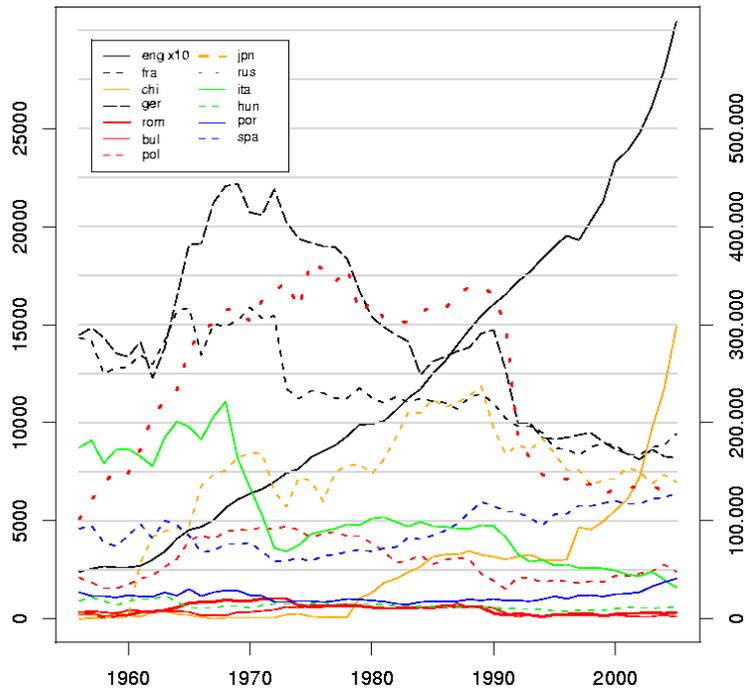
Does Government Ever Really Change?  
Five Ways Women Get Ahead

This block shows the cover of 'Government Executive' magazine. The title 'Government Executive' is at the top. The main headline is 'BIG DATA'. Below it, there is a 3D graphic of data cubes and a gear. On the right side, there are two sub-articles: 'Does Government Ever Really Change?' and 'Five Ways Women Get Ahead'.



# POWER

This block contains the text 'POWER' in large, bold, black letters, positioned at the bottom left of the collage.



<http://dan.corlan.net/medline-trend>



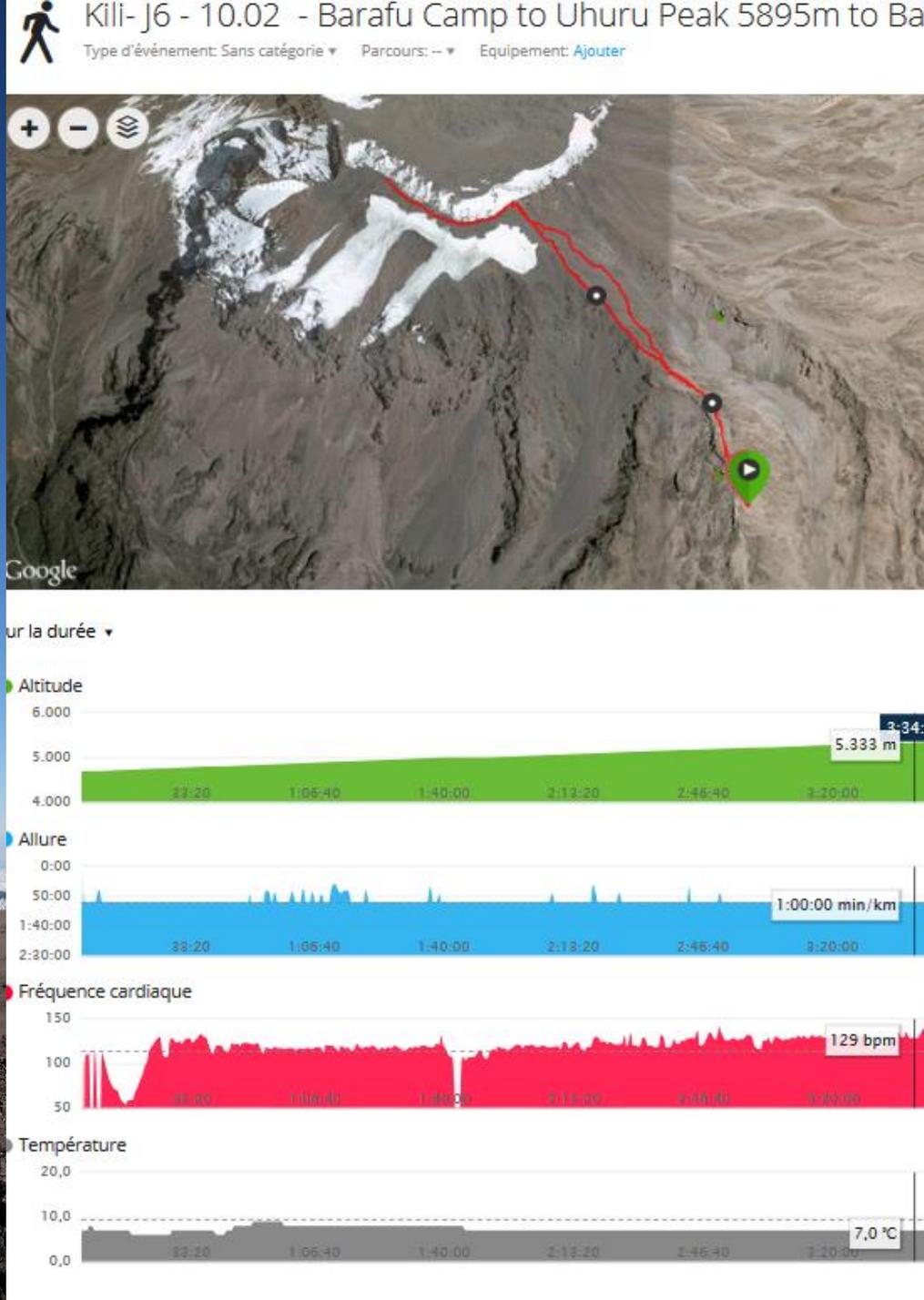


caller id

text messages

meeting reminders





# NO BAD DATA, NO NOISE ONLY DATA AND SIGNALS

---

Encompass all data, a new paradigm of approaching evidence

## Structured



## Unstructured



## Streaming



- ▶ Big Data = all data
- ▶ Quality cannot be improved, deal with what you have
- ▶ Data is flowing without stop, needs realtime analytics

# NUMEROUS SCIENTIFIC CHALLENGES

---

Interoperability  
semantics



Privacy



Streamed  
Data

10101  
01010  
00100

Distributed  
incremental  
Analytics



# Evidence based health informatics

## State of the Art in Clinical Informatics: Evidence and Examples

Allison B. McCoy, PhD<sup>1</sup>

Adam Wright, PhD<sup>2</sup>

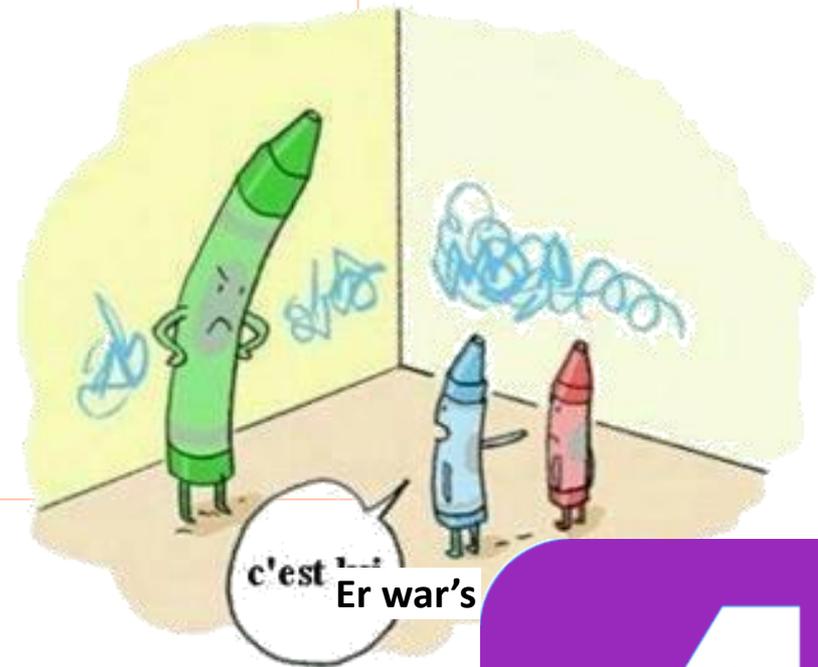
Gunther Eysenbach, MD, MPH<sup>3</sup>

Bradley A. Malin, PhD<sup>4,5</sup>

Emily S. Patterson, PhD<sup>6</sup>

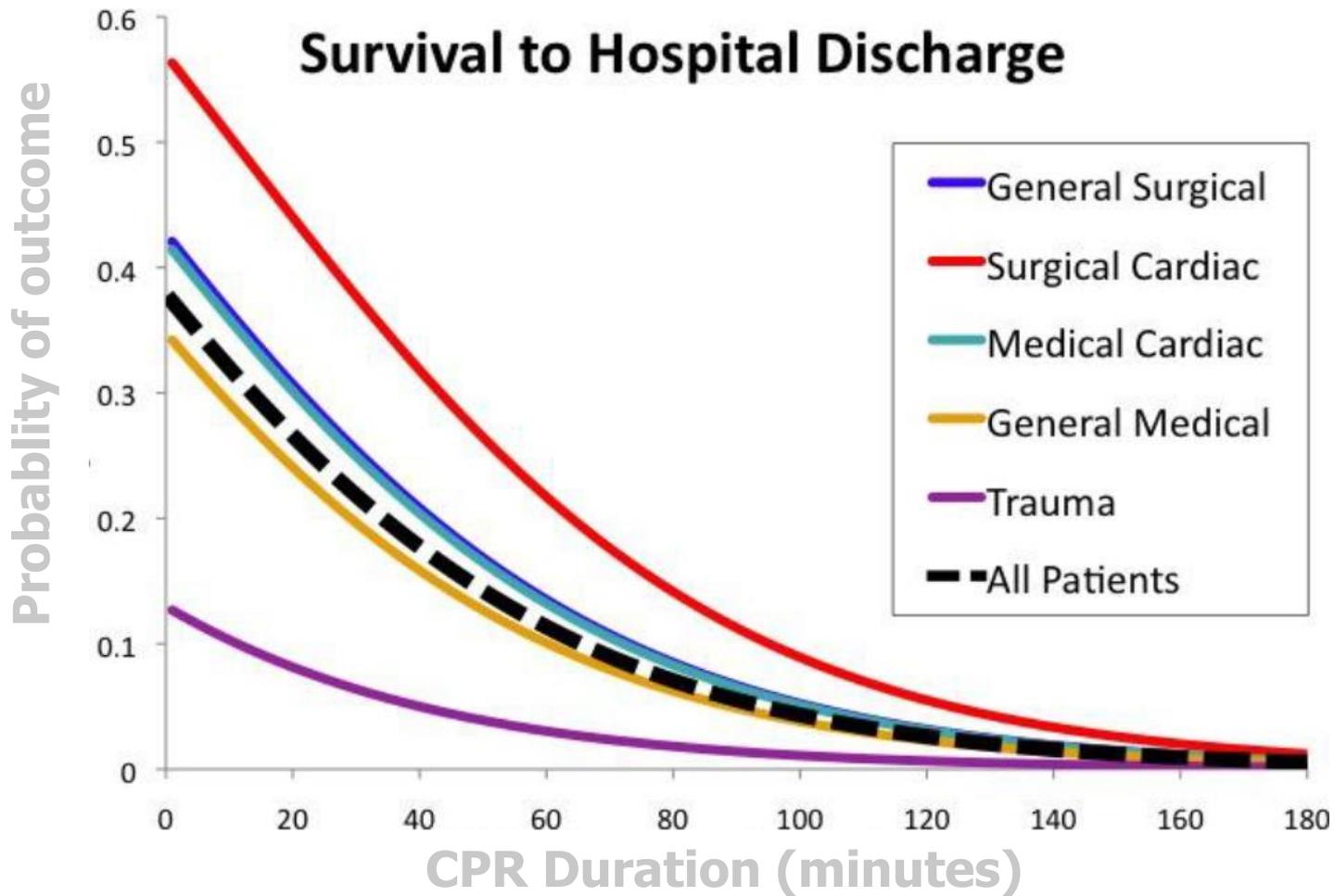
Hua Xu, PhD<sup>1</sup>

Dean F. Sittig, PhD<sup>1</sup>



Yearbook of medical informatics 2013  
survey paper by McCoy & all

4

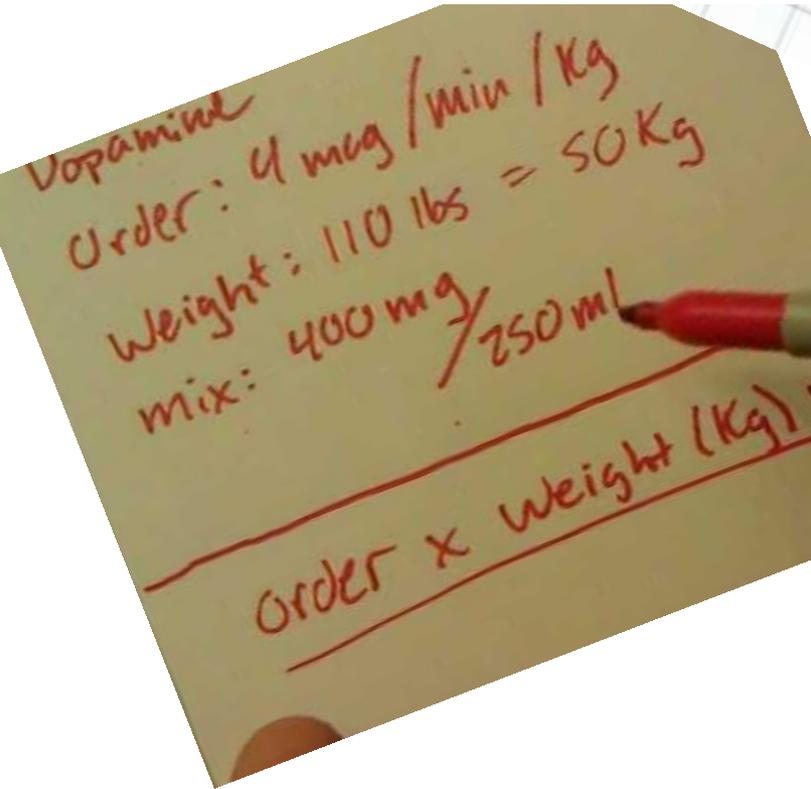


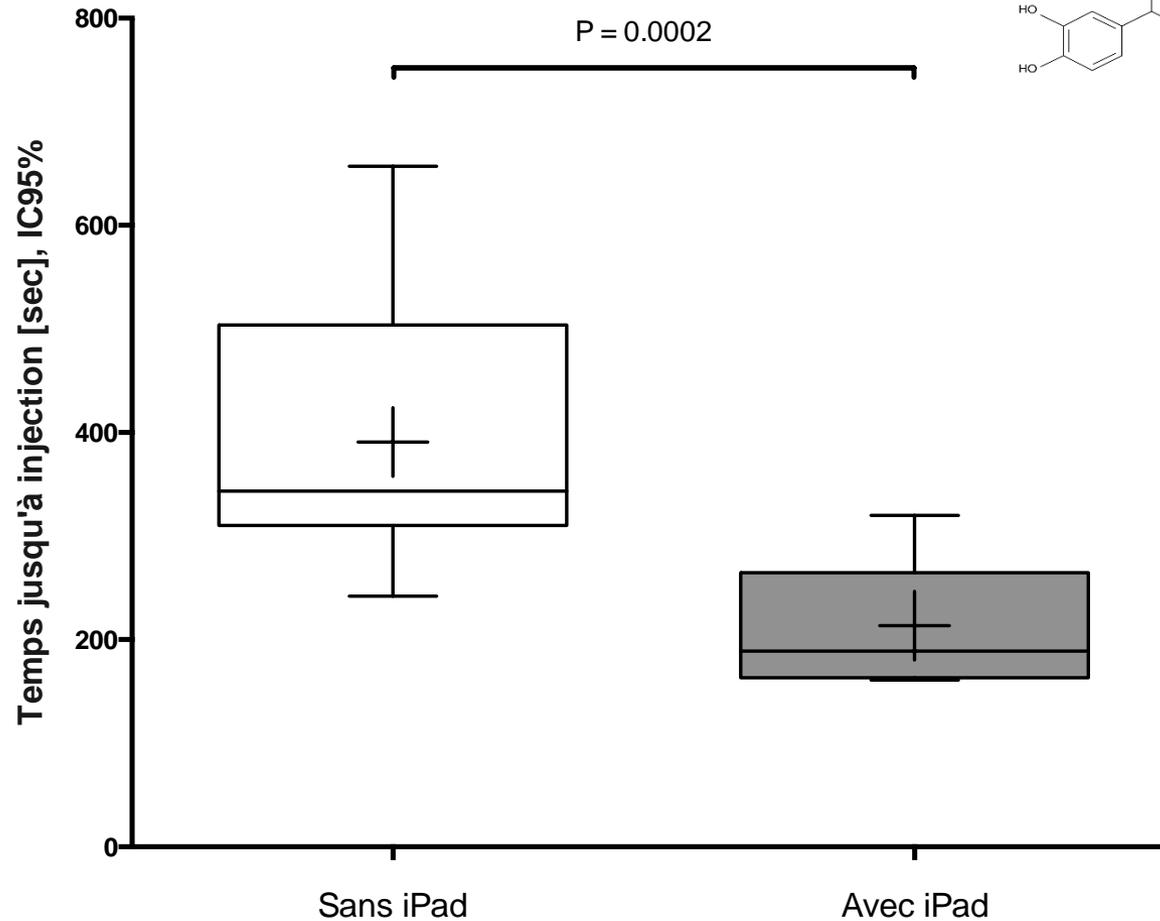
Matos RI et al. Circulation 2013

A. mg/min (For example - Lidocaine, Pronestyl)

$$\frac{\text{Solution cc}}{\text{Drug mg}} \times 60 \text{ min/hr} \times \text{mg/min} = \text{cc/hr}$$

$$\frac{\text{Drug mg} \times \text{cc/hr}}{\text{Solution cc} \times 60 \text{ min/hr}} = \text{mg/hr}$$

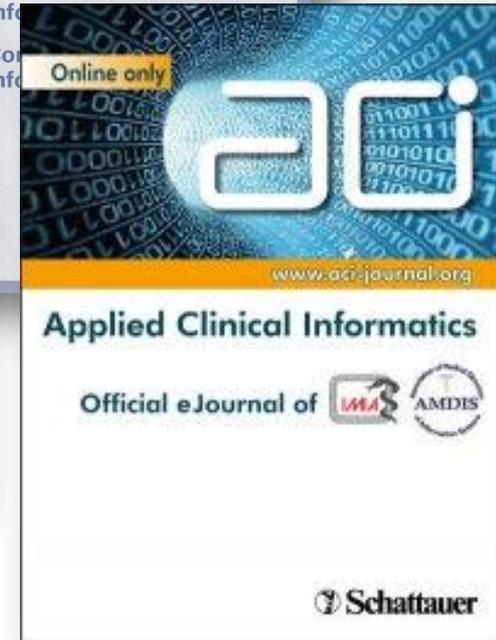
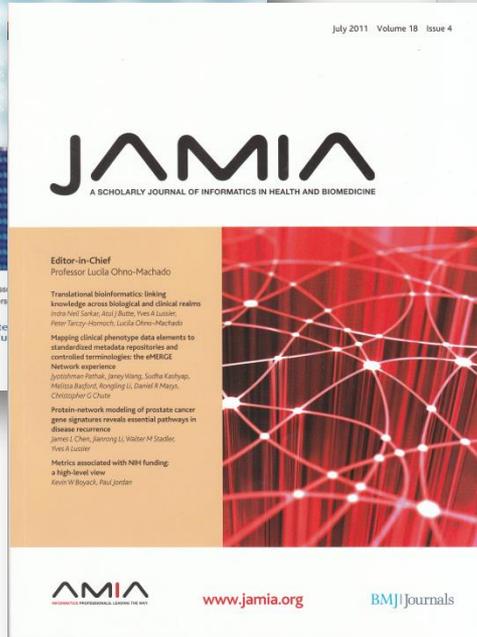
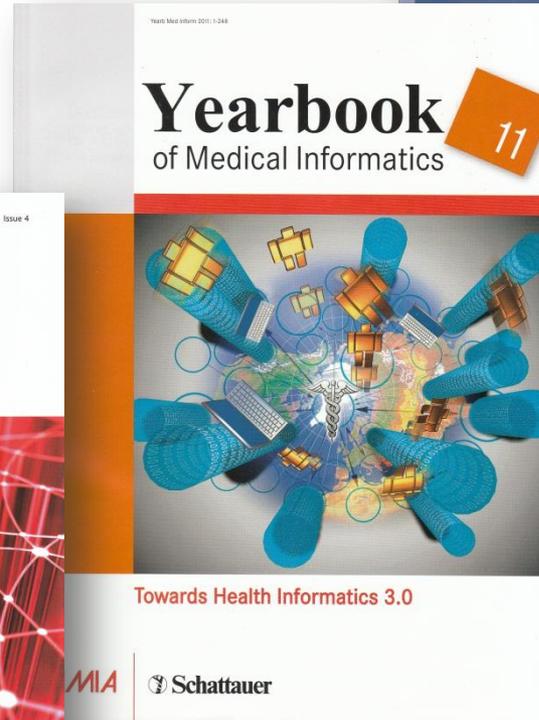
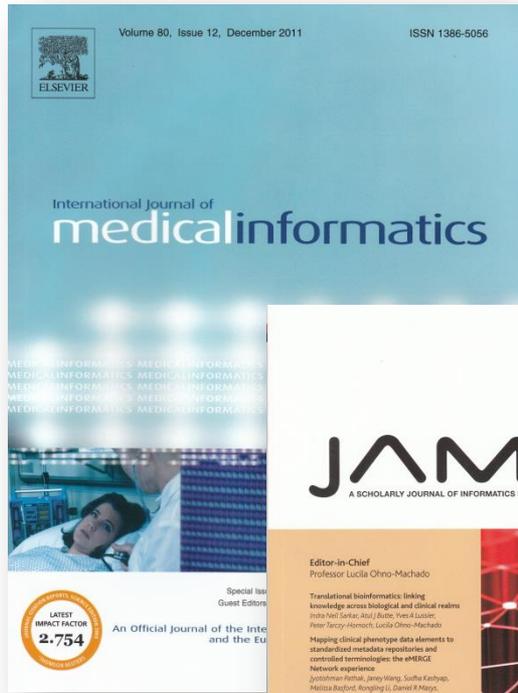




Temps jusqu'à injection réduit de 177 sec (43%) = augmentation survie > 6%

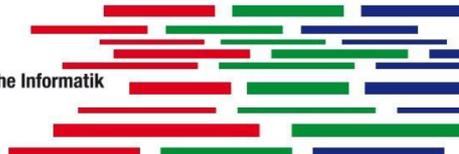
Erreurs médicamenteuses réduites de > 80%

# Medical Informatics : a Science



**SGMI SSIM SSMI**

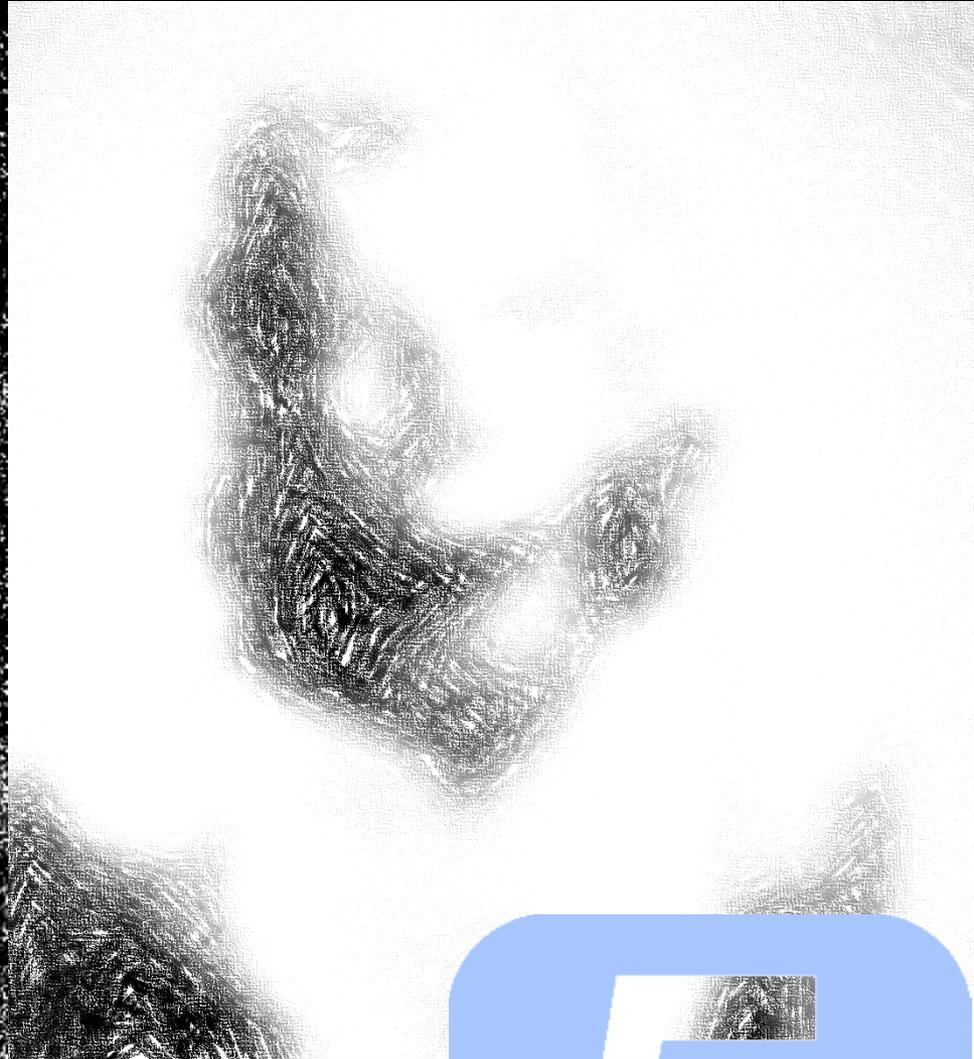
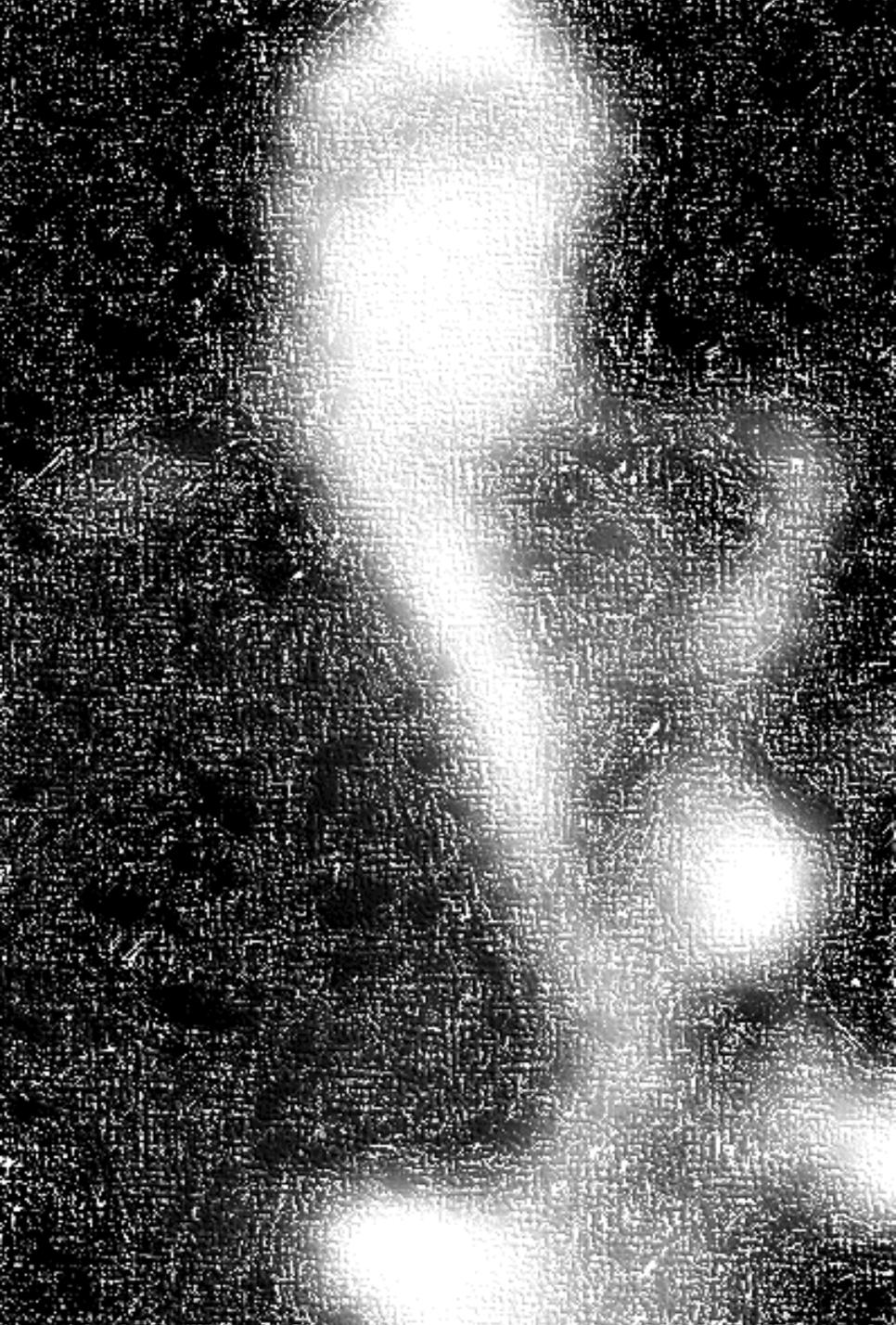
Schweizerische Gesellschaft für Medizinische Informatik  
Société Suisse d'Informatique Médicale  
Società Svizzera d'Informatica Medica  
Swiss Society for Medical Informatics



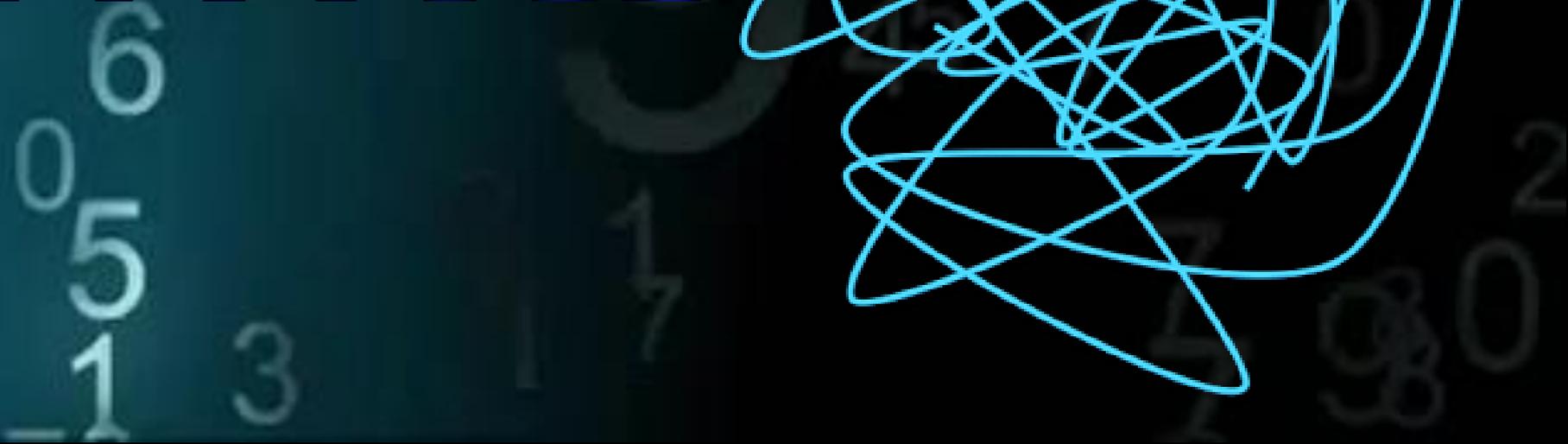
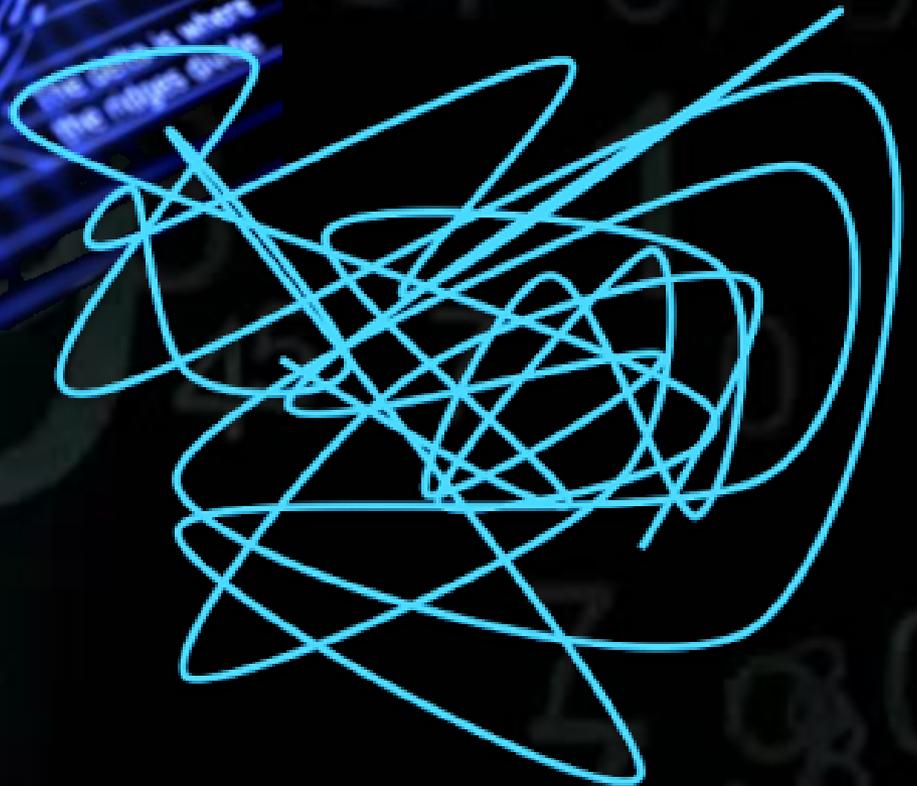
**EFMI**



EUROPEAN FEDERATION  
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PUBLIC HEALTH SCHWEIZ  
SANTÉ PUBLIQUE SUISSE  
SALUTE PUBBLICA SVIZZERA



The Swiss Society for Public Health

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Thank you very much for your attention

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14.45 – 15.05

**Keynote Lecture 1: Mehr Daten, mehr Sicherheit?**

**Prof. Dr. med. Christian Lovis**, Chefarzt Medical Information Sciences,  
Hôpitaux Universitaires de Genève (HUG)

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