INSELGRUPPE

Direktion Pflege/MTT –
Universitäre Forschung Pflege

Universität Basel

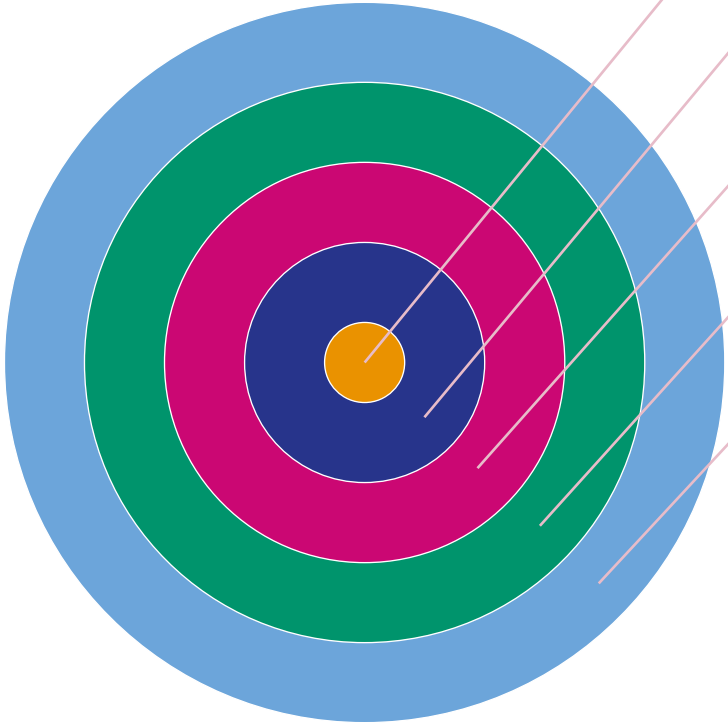
Medizinische Fakultät
Departement Public Health

Pflegewissenschaft
Nursing Science

Prof. Dr. Michael Simon

BIG DATA im Gesundheitswesen – eine Einführung

Was ist Big Data? Die 5 ‘V’s



Volume - Menge

Velocity - Geschwindigkeit

Variety - Vielfalt

Variability - Variabilität

Value - Nutzen

https://www.ibm.com/blogs/watson-health/the-5-vs-of-big-data/

Volume/Velocity – Menge/Geschwindigkeit

39,390,391,553

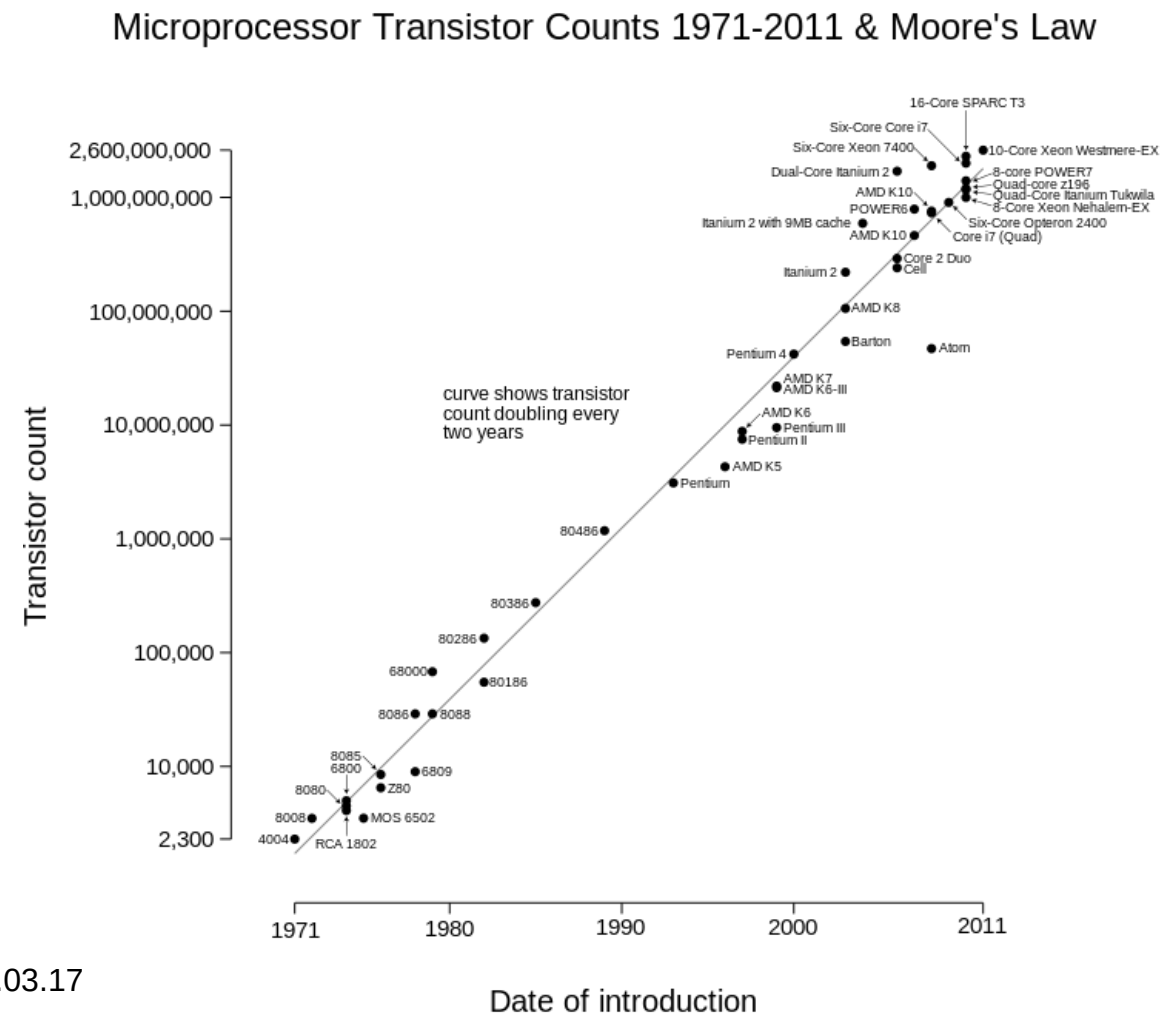
Tweets sent this year

13,972,925,809,742

Emails sent this year

222,260,085,484 GB

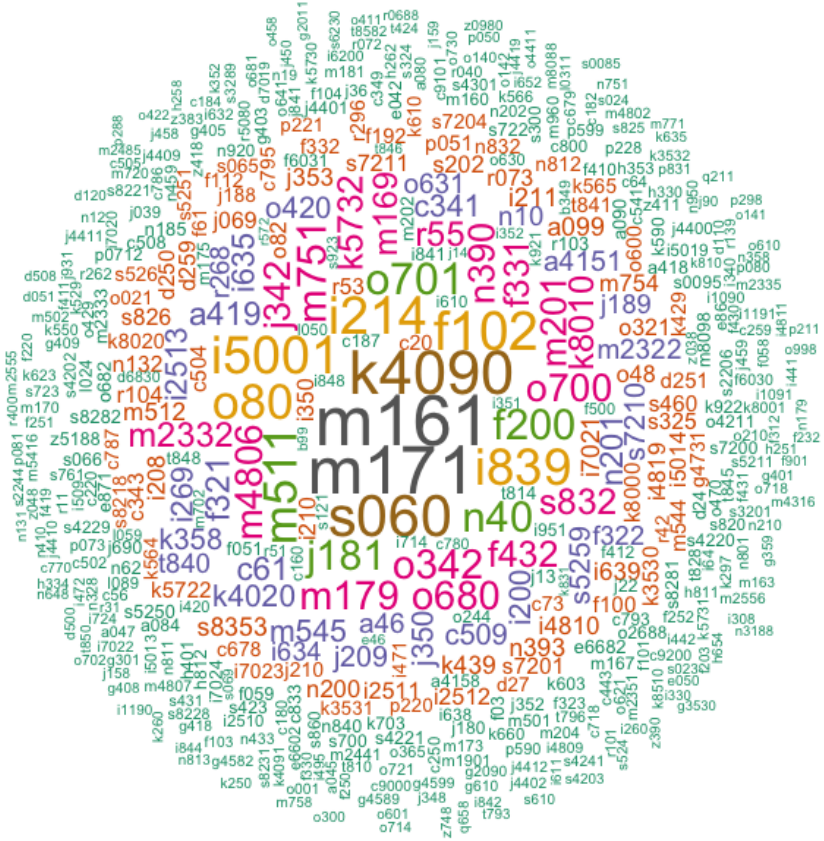
Internet traffic this year



http://www.internetlivestats.com/ 02.03.17

By Wgsimor

Variety - Vielfalt



Hospitalisierungen Schweiz 2013

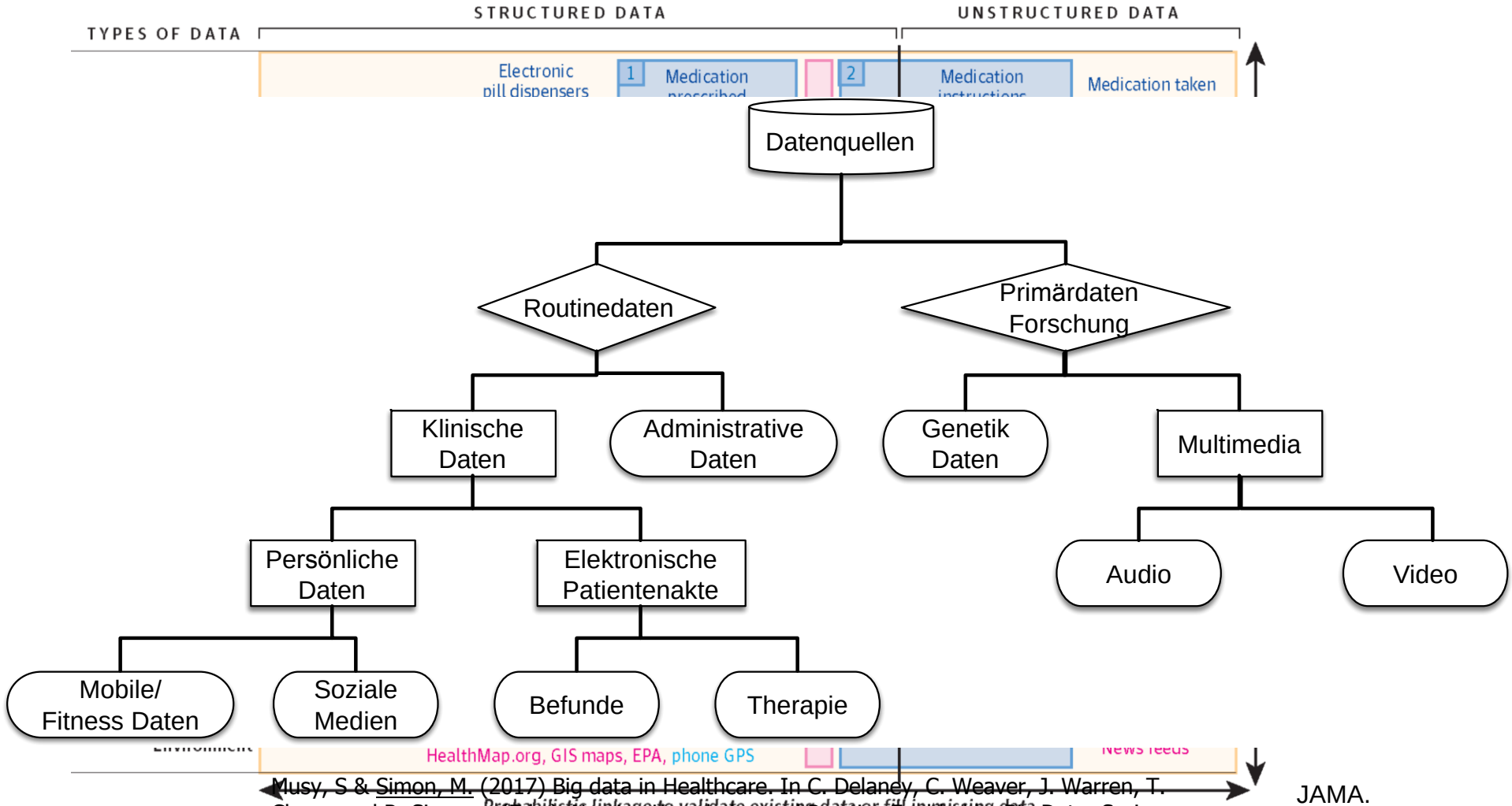
~ 1.3 Mio Fälle
> 9,000 Primärdiagnosen

Wordcloud – Stichprobe 10,000

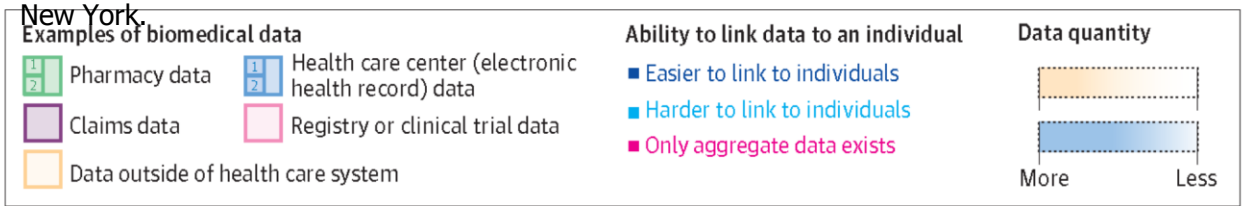
- M161 ca. 1% der Fälle
- 100 häufigsten Diagnosen nur 36% der Fälle

Eigene Analyse

Variability – Variabilität



Musy, S & Simon, M. (2017) Big data in Healthcare. In C. Delaney, C. Weaver, J. Warren, T. Clancy and R. Simpson (Eds.), Nursing Knowledge and Practice Enabled by Big Data: Springer, New York.



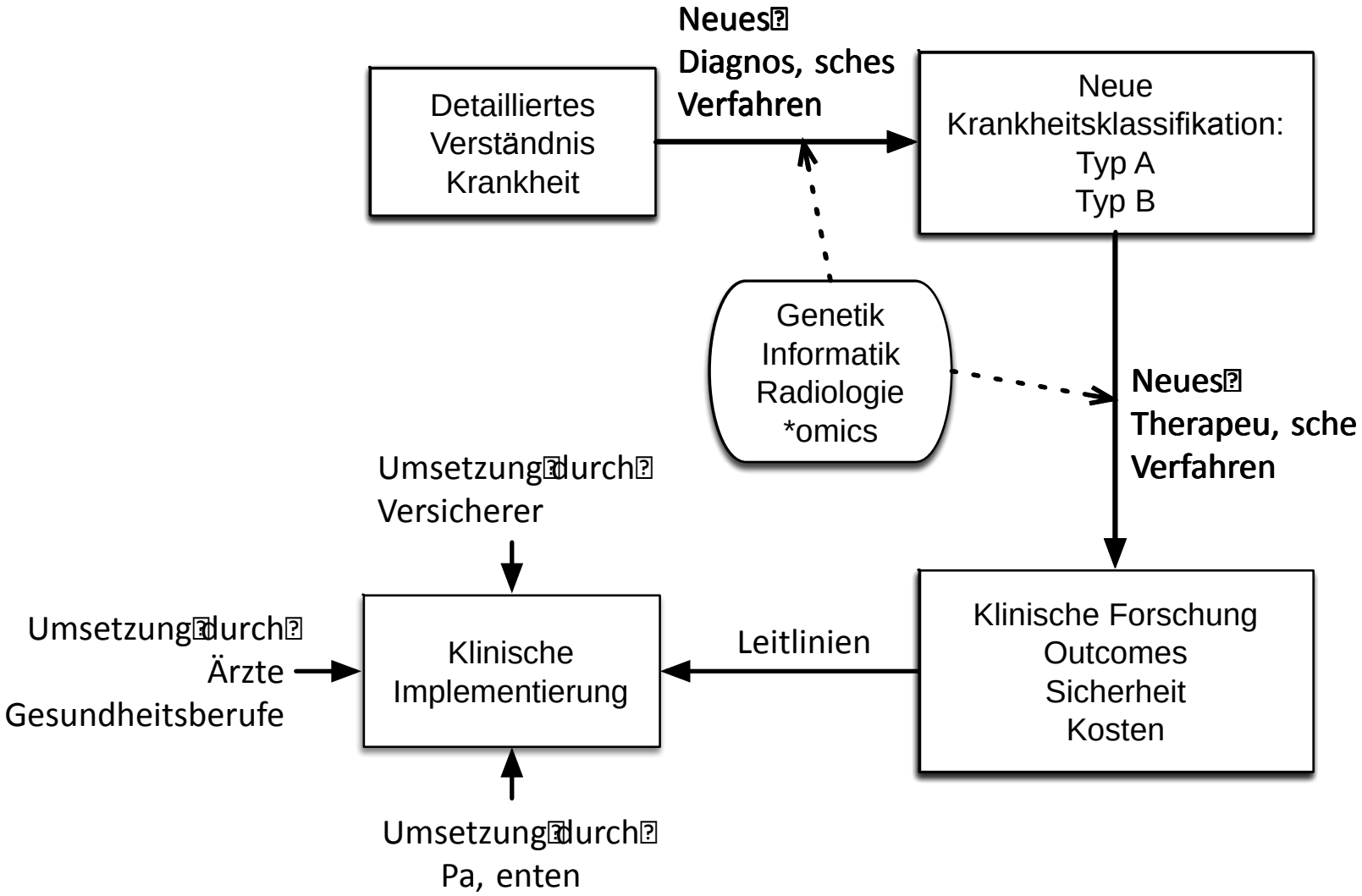
JAMA. 2014;311(24):2479-2480. doi:10.1001/jama.2014.4228

Value - Nutzen

- Precision Medicine – Personalisierte Medizin
- Health Services Research – Versorgungsforschung
- Analytics - Datenanalyse

http://nyphotographic.com/

Precision Medicine – Personalisierte Medizin



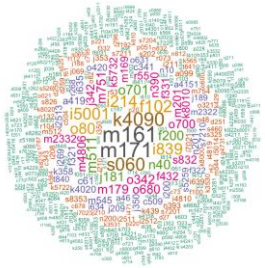
Modifiziert nach:
Precision medicine--personalized, problematic, and promising.
Jameson JL, Longo DL. N Engl J Med. 2015 Jun 4;372(23):2229-34. doi: 10.1056/NEJMsb1503104.

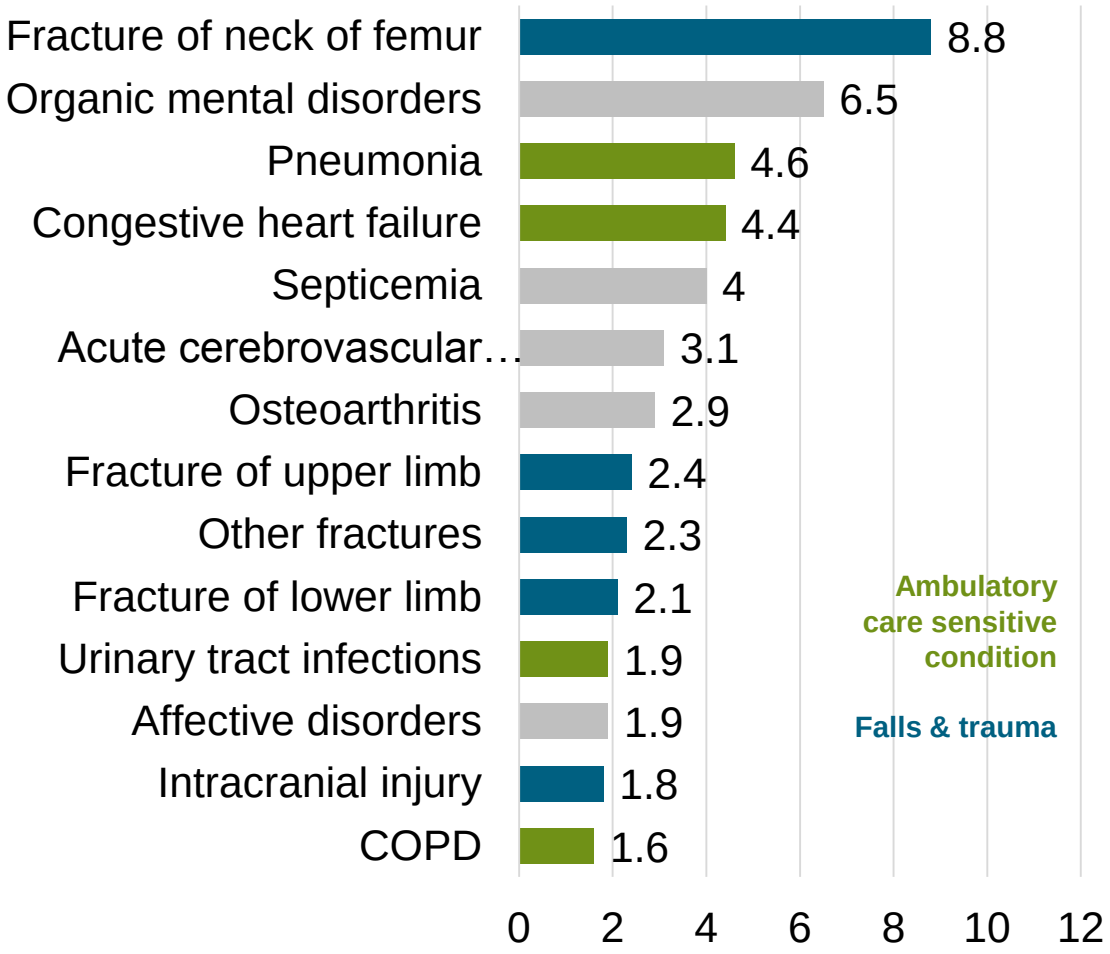
Health Services Research - Versorgungsforschung

Ziele:

- Strukturen der Gesundheitsversorgung optimieren
- Versorgungsqualität und Effizienz steigern
- Über-, Unter- und Fehlversorgung reduzieren
- Erhöhung von Patientenorientierung und - sicherheit

Vermeidbare Hospitalisierungen





Vermeidbare Hospitalisierungen

Alter >65 Jahre

n=21’114

Eigene Analysen

Development and testing of a text-
proach to analyse patients'
on their experiences

Phase 1: Development of thematic framework
(Step 1) Random sample 1 (n=400 comments) coded to test existing framework

Phase 2: Application of machine learning algorithms
(Step 2) Random sample 2 (n=400 comments) coded and combined with Random Sample 1 to create a test document matrix (TDM) (n=800 comments)
(Step 3) Algorithms trained and tested using TDM and applied to remaining dataset (4834 comments)
(Step 4) Comments pertaining to experiences of care retrieved from da

Phase 3: Qualitative analysis of comments retrieved through application of algorithms
(Step 5) Retrieved comments (n=1834) coded and analysed for patterns and relationships between quality of care and challenges to quality of life

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Downing,[4]

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[2]Institute of Nursing Science, University of Basel, Basel, Switzerland
[3]Directorate of Nursing/AHP, Inselspital Bern University Hospital, Bern, Switzerland
[4]Leeds Institute of Cancer & Pathology, University of Leeds, Leeds, UK

(HRQoL). Free-text responses to
outcome measures (PROMs) pr
but analysis is time and resourc
study developed and tested a l
text-mining approach to facilita
patients' experiences of care ar
explanatory model illustrating impact on HRQoL.

INTRODUCTION

Wagland, R., Recio-Saucedo, A., Simon, M., Bracher, M., Hunt, K., Foster, C., . . . Corner, J. (2016). Development and testing of a text-mining approach to analyse patients' comments on their experiences of colorectal cancer care. *BMJ Qual Saf, 25*(8), 604-614.

ELSEVIER

JAMDA

journal homepage: www.jamda.com

Original Study

Differences in Case Conferences in Dementia Specific vs
Tradit
from a

Rebecca
Sabine

[a] German Cer
[b] Departmen
[c] Martin-Luth
[d] Faculty of M
[e] Nursing and

"Genetic matching was used to determine the optimal covariate balance in the matched sample. This machine learning algorithm searches for the best covariate balance by minimizing the largest discrepancy in the observed covariate based on a propensity score. "

Keywords:
Dementia
dementia sp
case confere
nursing hom

people
ursing
ences

using genetic propensity score matching over all of the observed potential covariates, including the characteristics that served as admission criteria for DSCUs. Because of the multisite structure of the data, clustering was accounted for with a generalized mixed model.

Setting: DSCUs are defined as units within nursing homes that offer care exclusively to residents with dementia and that charge higher rates for the specialized care provided. TCUs are defined as care units for residents with and without dementia.

Participants: A matched sample was drawn out of a convenience sample of 1808 residents from 51 nursing homes. It consisted of 264 residents from 16 DSCUs and 264 residents from 48 TCUs.

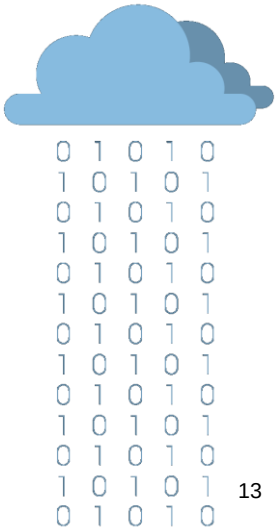
Interventions: None

Palm, R., Trutschel, D., Simon, M., Bartholomeyczik, S., & Holle, B. (2016). Differences in Case Conferences in Dementia Specific vs Traditional Care Units in German Nursing Homes: Results from a Cross-Sectional Study. *J Am Med Dir Assoc, 17*(1), 91 e99-13. doi:10.1016/j.jamda.2015.08.018

Was kommt auf die Gesundheitsberufe zu?

- Hoher Grad der Ausdifferenzierung von Diagnostik & Therapie
- “Big Data ist überall”
- Mehr Transparenz
- Gesundheitsberufe werden noch anspruchsvoller

Vielen Dank!



Vielen Dank!