The *In-HospiTOOL* Project

Verkürzt die systematische interprofessionelle Austrittsplanung die Aufenthaltsdauer im Spital ?

Health Symposium 19, Bern
November 22nd, 2019

Smarter Health Care

Prof. Beat Mueller, MD and Alexander Kutz, MD
For the *In-HospiTOOL* study group

Who are we?

… a large family!

Universitätsspital Basel

Herr Prof. St. Bassetti
Herr PD J. Eckstein
Herr Dr. F. Ebrahimi
Frau A. Ulrich
Frau J. Putbrese

Spital Thurgau MÜNSTERLINGEN

Herr Dr. C. Hoess
Frau I. Sasso / Herr M. Krumpe
Frau S. Näpflin
Herr M. Wittek
Frau H. Dürger

fmi Spitäler fmi AG

Herr Dr. H. Schaad
Frau R. Schärli
Herr P. Catani
Herr Dr. R. Weber

SPITAL MURI

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Frau A. Käppeli
Frau L. Küng
Frau D. Schmidt

Kantonsspital Baden KSB

Herr Dr. M. Egloff
Frau E. Mascheroni
Frau B. Bäbler
Herr M. Jochem

spitalzofingen

Herr Dr. T. Ehmann
Herr Dr. A. Häring
Frau M. Matter
Frau N. Aeschbach

Kantonsspital Aarau

fmc Schweizer Forum für Integrierte Versorgung
Forum suisse des soins intégrés
Forum svizzero delle cure integrate

Herr U. Zanoni

Herr Prof. B. Müller
Herr Dr. A. Kutz
Herr Prof. Ph. Schuetz
Frau H. Weber
Frau G. Vossler
Frau A. Conca
Herr D. Koch
Frau M. Prins
Frau K. Regez
Frau U. Schild
Frau Z. Caldara
Herr A. Hürlimann

KANTON AARGAU
DEPARTEMENT GESUNDHEIT UND SOZIALES

Frau B. Hürlimann

CISTEC

Herr A. Kundert
Frau S. Bürki
Herr C. Bächli

74 NFP Gesundheitsversorgung
Nationales Forschungsprogramm

Herr M. Puhan
Frau K. Peter
Frau D. Oetterli
Herr R. Heusser

college

Herr PD P. Berchtold

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Eidgenössisches Departement des Innern EDI
Bundesamt für Statistik BFS

Herr Dr. U. Wagner

Berner Bildungszentrum Pflege

Frau I. Ludwig

In-HospiTOOL

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Background

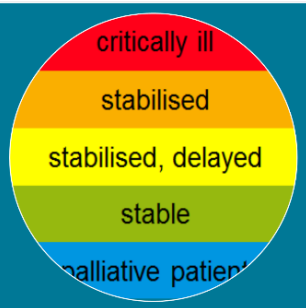
Current situation

Ageing population ↑
Multimorbidity/
Chronicity ↑
Diagnosis related groups
Length of hospital stay

Innovative diagnostics and therapeutics

Health care costs↑

Missing Link
Evidence-based instrument leading to improved patient care

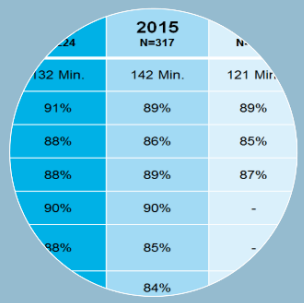


Resource optimisation

Waiting time emergency department
Length of hospital stay
Hospital readmission

Inter-professional collaboration

Discharge planning
Days spent in hospital after application to post-acute care institution
Discharge delays
Patient satisfaction



Quality & Transparency (Benchmarking)

Patient outcome
Objective and transparent quality measurement
Care processes

07/2017 → 01/2019

Expected results

Inter-professional collaboration ↑
&
Quality data for process optimisation

Quality optimisation
Emergency consultation↓
Hospital readmission↓
Mortality↓
Waiting time↓
Patient satisfaction↑

Profitability
Length of hospital stay↓
Treatment costs↓

Kutz et al. BMC Health Services Research 2019

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Emergency Department
“Initial assessment”

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Ärztliche Ersterfassung vom 16.02.2017

Bond James, 01.01.1950/M
, Tel.: 077 777 77 77, PID/FID: T001/999999901
Versicherungsklasse: Allgemein

Initialer Behandlungsort	: über ZNM eingetreten
Zuweisung / Eintritt von	: Übernahme aus Notfallpraxis

Medizinische Informationen

Eintritt am	: 16.02.2017
primär:	KAR Kardiologie
sekundär:	
Medizinisches Hauptsymptom bei Eintritt	: Schmerzen thoracal
Medizinische Eintrittsdiagnose	: Herzinfarkt/Koronares Ereignis
Anzahl aktive medizinisch Probleme bei Eintritt [?]	: 1

Voraussichtliche Austrittsplanung (Visitentool)

Medizinischer Hospitalistionsbedarf (Triage Score) [?]	: Medizinisch stabilisierend
Voraussichtliches Entlassdatum	: 22.02.2017

Zeiterfassung Patientenablauf ZNM

Hautpdiagnose-relevante Medikation [?]	: Antikoagulation/Tc-Hemmer, Thrombolytika bei KHK, LE, TVT oä
Verabreichung von diagnose-relevanter Medikation	: 16.02.2017 / 17:57
Ärztlicher Abschluss, bereit zur Verleg./Entlass. [?]	: 16.02.2017 / 19:00
Patientenzufriedenheit beim Verlassen des ZNM	: 9
Verzögerungsgrund	: Diagnostik - KAR: Koronarangiographie

Visum AA: **Visum OA:**

→ **PACD Score**

→ **Ressource allocation, possible discharge date**

→ **“Timeliness”**

→ **Satisfaction**

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On the medical ward

“Visitentool” – individualized discharge planning

	Physician	Nurse	Social worker / CM
Triage Score:	KSAANGAB / 12.12.2013 03:00:00 Medizinisch stabil	KSAANGAB / 12.12.2013 10:00:00 Austrittsbereit PACD d1: 10 PACD d3: 10 SPI: -	KSAANGAB / 10.12.2013 16:00:00 Definitiver Termin aber verzögert
Mögl. Austritt:	10.12.2013 Zust. AA + Tel:	12.12.2013	12.12.2013 Zust. SD MA + Tel:
	Medizinische Eintrittsdiagnose: acs	**Zielaustrittszustand:** mobil mit Hilfsmitteln genügend Kraft/Energie bestehendes Betreuungsnetz angepasst	**Austrittsart:** Akut- und Übergangspflege
	NLC: Ja	**Sozialdienst erforderlich?** AH/PH Temporär: AÜP **Pflege organisiert:**	**Austrittsort:** Schinznach **Anmeldung Sozialdienst** Anmeldung Sozialdienst Formulare Nachsorgelösung
Verzögerung:			Platz erst dann frei
Austritts-vorstellung:		**Patientensicht** Patient möchte wieder nach Hause austreten **Angehörigensicht** Angehörige möchten PAtient nach AÜP wieder nach Hause nehmen und bis dahin alles regeln	
Mitteilungen:			

Historie Triagekategorie

	Arzt			Pflege			Sozialdienst	
Datum	**Triage Score**	**mögl. Austritt**	**NLC**	**Triage Score**	**mögl. Austritt**	**SPI**	**Triage Score**	**mögl. Austritt**
12.12.2013	Medizinisch stabil	10.12.2013	Ja	Austrittsbereit	12.12.2013			
11.12.2013	Medizinisch stabil	10.12.2013	Ja	Austrittsbereit, aber verzögert	12.12.2013			
10.12.2013	Medizinisch stabil	10.12.2013	Nein	Massnahmen eingeleitet	12.12.2013		Definitiver Termin aber verzögert	12.12.2013
09.12.2013	med. stabil, Entlassung verzögert	10.12.2013	Nein	Massnahmen eingeleitet	12.12.2013			
08.12.2013	stabilisierend, Konzept erstellt	14.12.2013	Nein	Massnahmen eingeleitet	12.12.2013			
07.12.2013	stabilisierend, Konzept erstellt	14.12.2013	Nein	Massnahmen eingeleitet	12.12.2013		Extern angemeldet	13.12.2013
06.12.2013	Medizinisch instabil oder unklar	14.12.2013	Nein	PACD >= 8 u./od. Nachsorgebedarf	12.12.2013		In Bearbeitung	13.12.2013
05.12.2013	Medizinisch instabil oder unklar	14.12.2013	Nein	PACD >= 8 u./od. Nachsorgebedarf	12.12.2013		In Bearbeitung	13.12.2013

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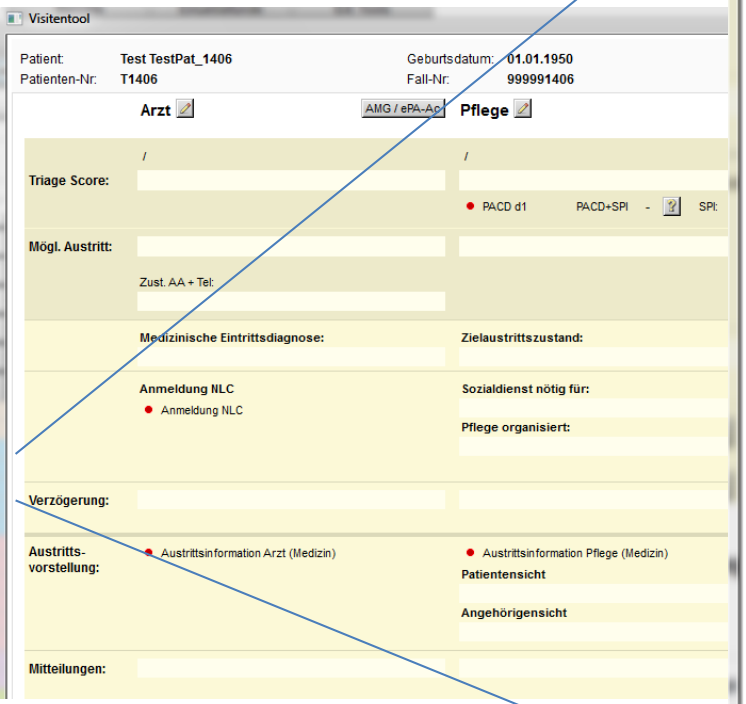
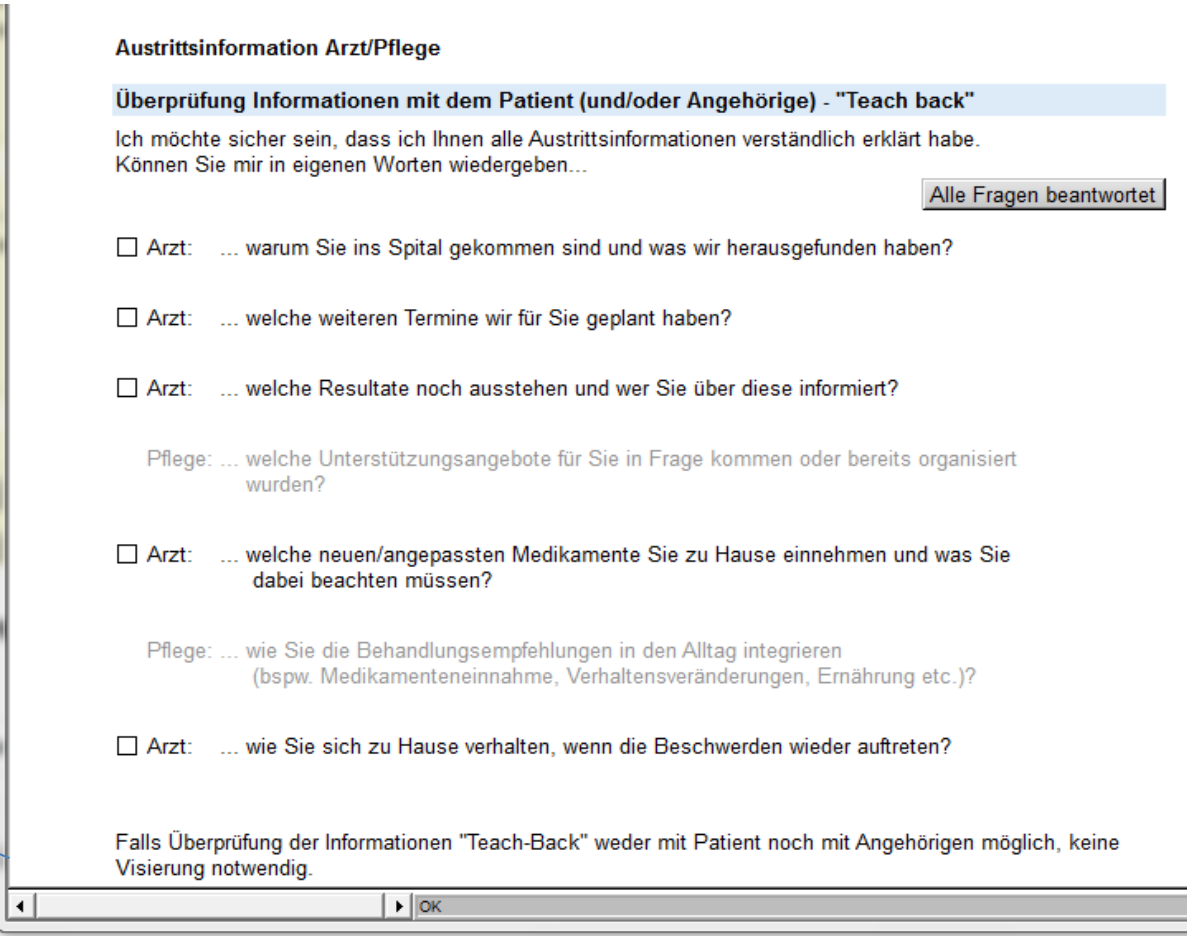
«BOOST» upon discharge
Important discharge information





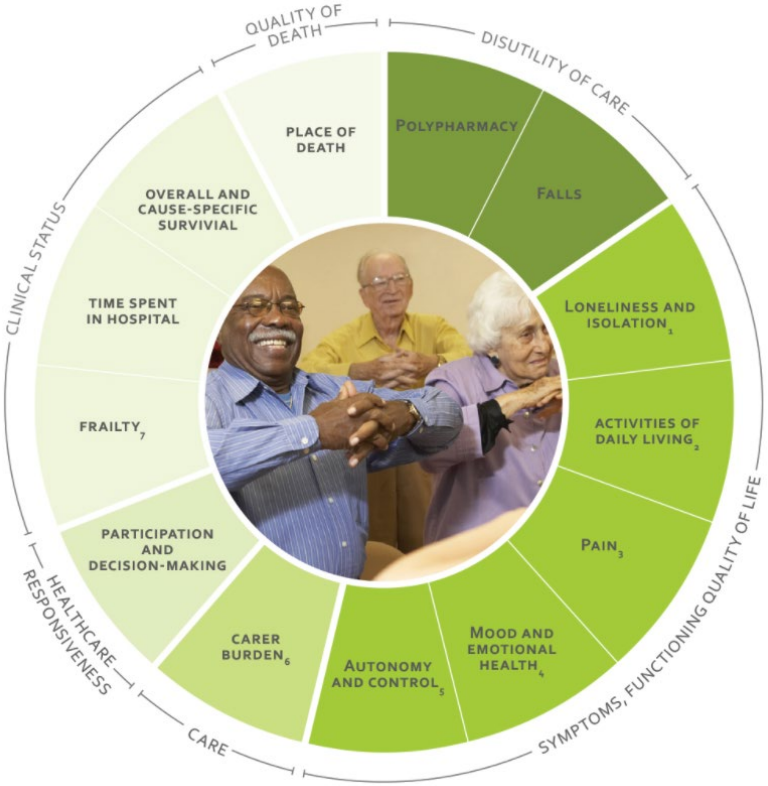
Adapted from Jack et al., 2009

30-day Follow-Up

In-HospiTOOL Interview

Start «Cockpit» User-oriented key data

(«Nutzer-Orientierte Kennzahlen» - NOK)



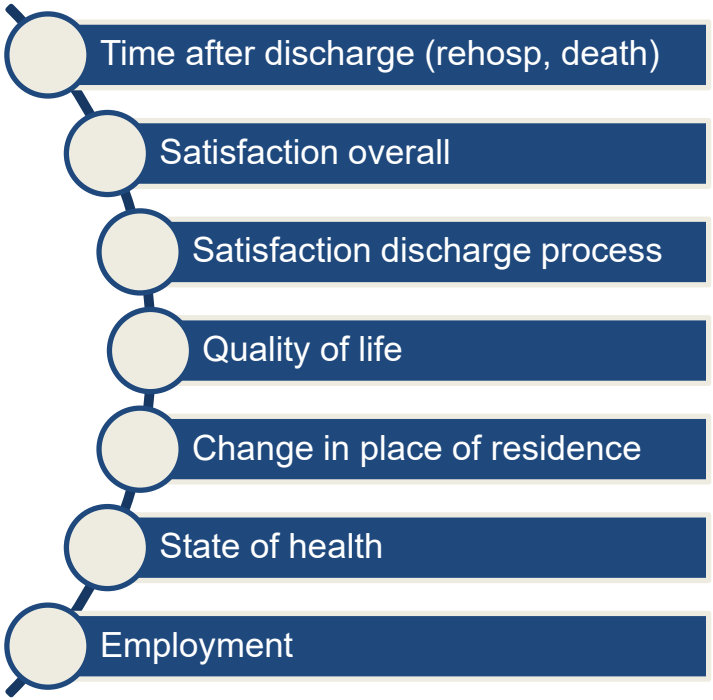


Fig. 1: Aspects of the In-HospiTOOL Interview

Modified from http://www.ichom.org/medical-conditions/older-person, last visit August 22th, 2019

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Review

Established in 1871

Swiss Medical Weekly

Formerly: Schweizerische Medizinische Wochenschrift

An open access, online journal • www.smw.ch

Review article: Biomedical intelligencce | Published 22 October 2017 | doi:10.[illegible]/smw.2017.14515

Cite this as: Swiss Med Wkly. 2017;147:w14515

Poor Evidence !!

Innovative transition interventions to better align healthcare needs in hospitalised medical patients

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[b] Division of Endocrinology, Diabetes and Clinical Nutrition, University Hospital Basel, Switzerland
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„Methods and Elements“

Kutz *et al. BMC Health Services Research* (2019) 19:237
https://doi.org/10.1186/s12913-019-4045-x

BMC Health Services Research

STUDY PROTOCOL Open Access

Integrative hospital treatment in older patients to benchmark and improve outcome and length of stay – the *In-HospiTOOL* study

Alexander Kutz[1*], Daniel Koch[1], Antoinette Conca[1], Ciril Baechli[1], Sebastian Haubitz[1], Katharina Regez[1], Ursula Schild[1], Zeljka Caldara[1], Fahim Ebrahimi[2], Stefano Bassetti[2], Jens Eckstein[2], Juerg Beer[3], Michael Egloff[3], Vladimir Kaplan[4], Tobias Ehmann[5], Claus Hoess[6], Heinz Schaad[7], Ulrich Wagner[8], Sabina de Geest[9], Philipp Schuetz[1] and Beat Mueller[1]

Effect of SwissDRG ?

JAMA Network | Open

Original Investigation | Health Policy

Association of the Swiss Diagnosis-Related Group Reimbursement System With Length of Stay, Mortality, and Readmission Rates in Hospitalized Adult Patients

Alexander Kutz, MD; Lara Gut, MD; Fahim Ebrahimi, MD; Ulrich Wagner, PhD, MPA; Philipp Schuetz, MD, MPH; Beat Mueller, MD

Kutz et al. JAMA Network Open, 2019

Effect of SwissDRG ?

Table 1. Characteristics of Hospitalized Medical Patients

Variable	Before SwissDRG Implementation, 2009-2011, No. (%)	After SwissDRG Implementation, 2012-2015, No. (%)
Sociodemographic		
Hospitalization, No.	1 018 404	1 408 318
Age, median (IQR)	69 (55-80)	70 (56-81)
Male sex	531 226 (52.2)	730 228 (51.9)
Swiss resident	850 773 (83.5)	1 164 185 (82.7)
Hospital teaching level		
Tertiary care hospital	594 814 (58.4)	995 570 (70.7)
Secondary care hospital	387 733 (38.1)	382 833 (27.2)
Other	35 857 (3.5)	29 915 (2.1)

Table 2. Interrupted Time Series for Risk-Adjusted Length of Hospital Stays, In-Hospital Mortality, and 30-Day Readmission Rates

	Years Before SwissDRG Implementation			Years After SwissDRG Implementation			
Clinical Outcome	2009	2010	2011	2012	2013	2014	2015
Overall							
Length of hospital stay, mean (SD), d	8.0 (12.7)	7.8 (11.4)	7.7 (14.1)	7.6 (10.3)	7.4 (9.2)	7.3 (8.7)	7.2 (17.3)

~ -0.1 day/y since SwissDRG implementation

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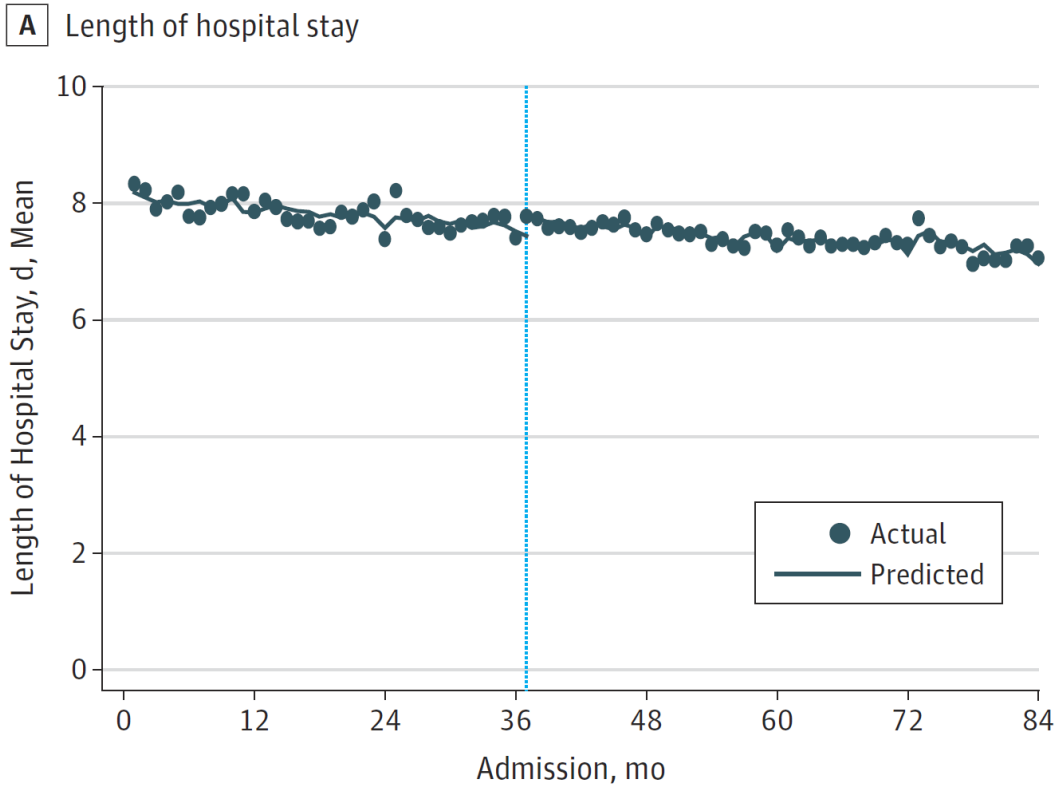
No additional effect on length of stay

Figure 2. Time Trends in Risk-Adjusted Length of Hospital Stay, In-Hospital Mortality, and 30-Day Readmission Rates

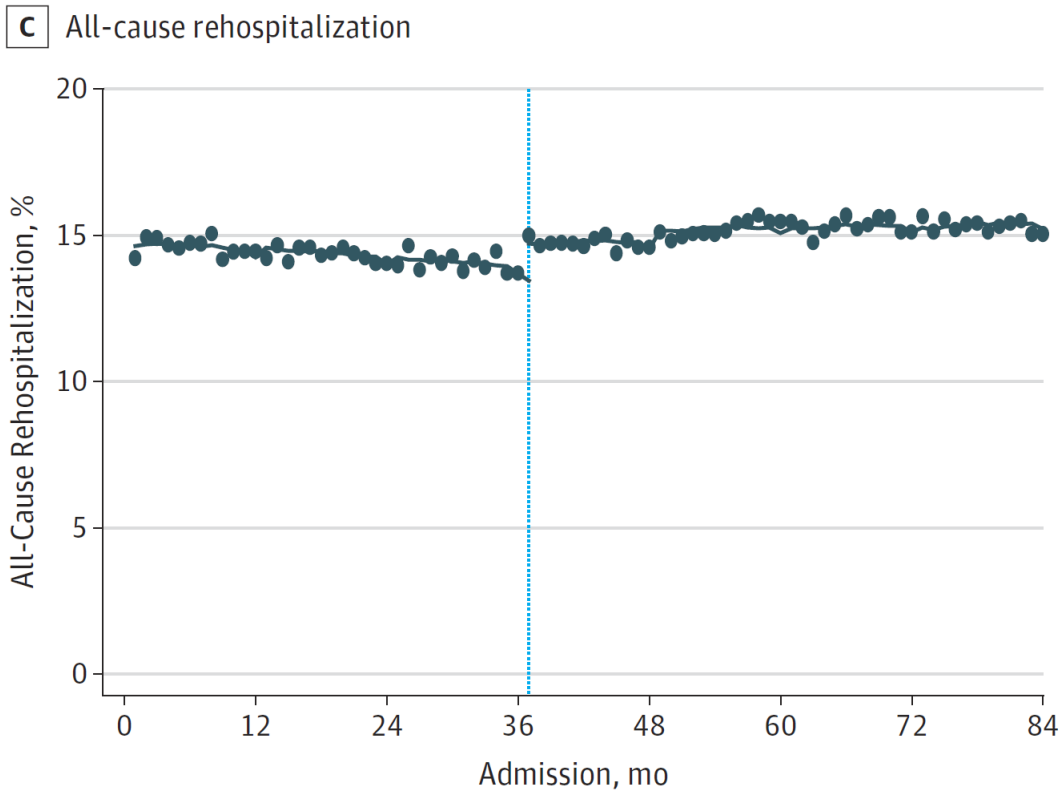


Difference between slopes per month (0 days, 95% CI [-0.007 to 0.007])

Kutz et al. JAMA Network Open, 2019

…however, readmission increased

Figure 2. Time Trends in Risk-Adjusted Length of Hospital Stay, In-Hospital Mortality, and 30-Day Readmission Rates



Difference between slopes per month (0.03 %, 95% CI [0.025 to 0.042]) = absolute 1.6% over 4 years after SwissDRG implementation, relative +10%!

Scientific results for knowledge transfer

In preparation for the final analysis…

Grossangelegte Studie gewährt erstmals fundierten Einblick in die Auswirkungen von SwissDRG

SwissDRG und nutzerorientierte Kennzahlen – Zeit, Bilanz zu ziehen

Alexander Kutz[a], Philipp Schuetz[b], Beat Müller[c]

[a] Dr. med., Postdoc Klinische Forschung, Medizinische Universitätsklinik, Kantonsspital Aarau AG, Aarau, Mitglied FMH; [b] Prof. Dr. med., Facharzt für Innere Medizin und Endokrinologie, Master of Public Health, Chefarzt Allgemeine Innere Medizin, Medizinische Universitätsklinik, Kantonsspital Aarau AG, Aarau, Mitglied FMH; [c] Prof. Dr. med., Facharzt für Innere Medizin und Endokrinologie, Leiter Medizinische Universitätsklinik, Bereichsleiter Medizin, Chefarzt Endokrinologie, Diabetologie und Metabolismus, Kantonsspital Aarau AG, Aarau, Mitglied FMH

Kutz et al. SAeZ, 2019

…thus, alternative – more individualized approaches urgently needed !

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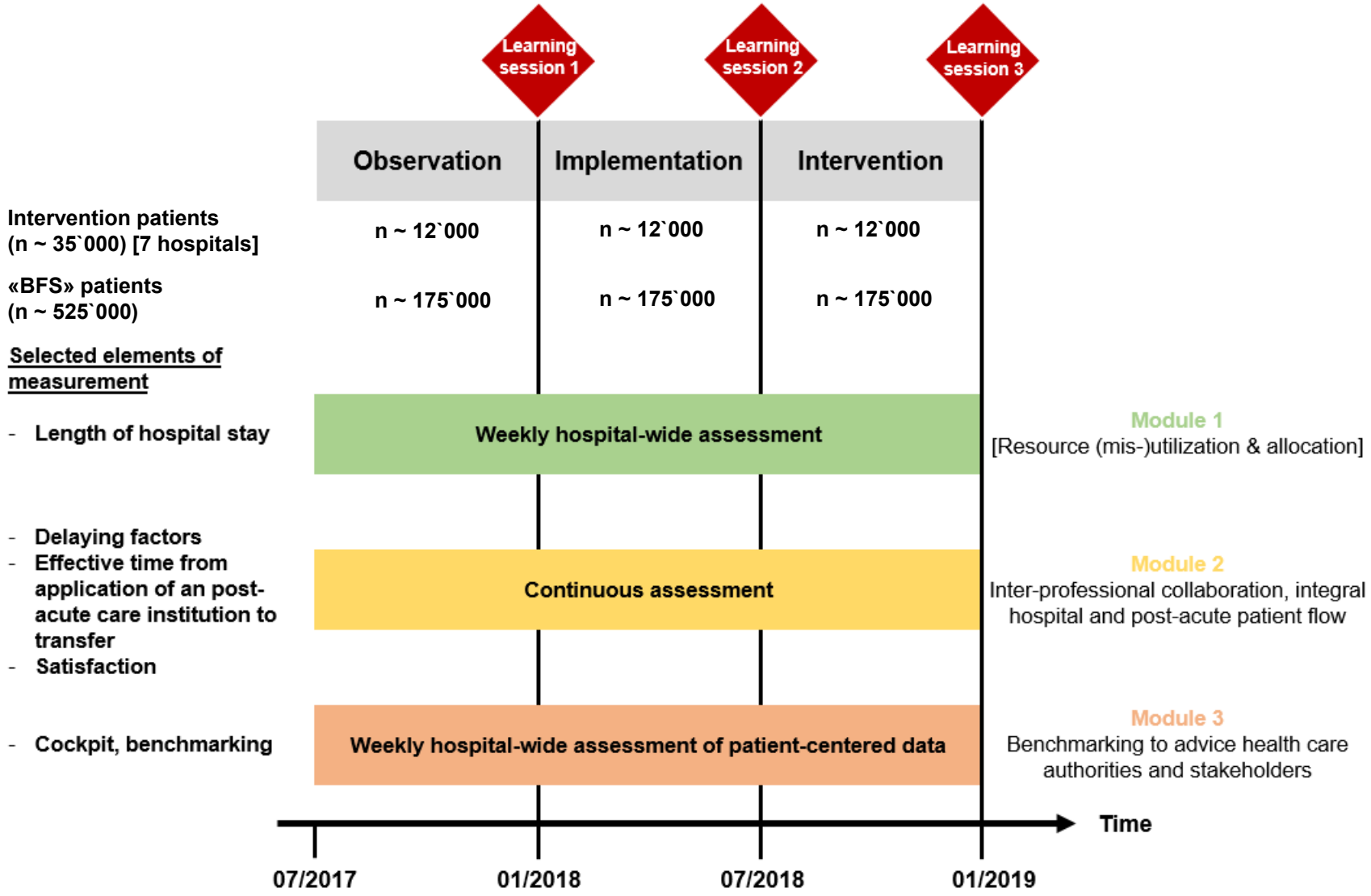
Project timeline



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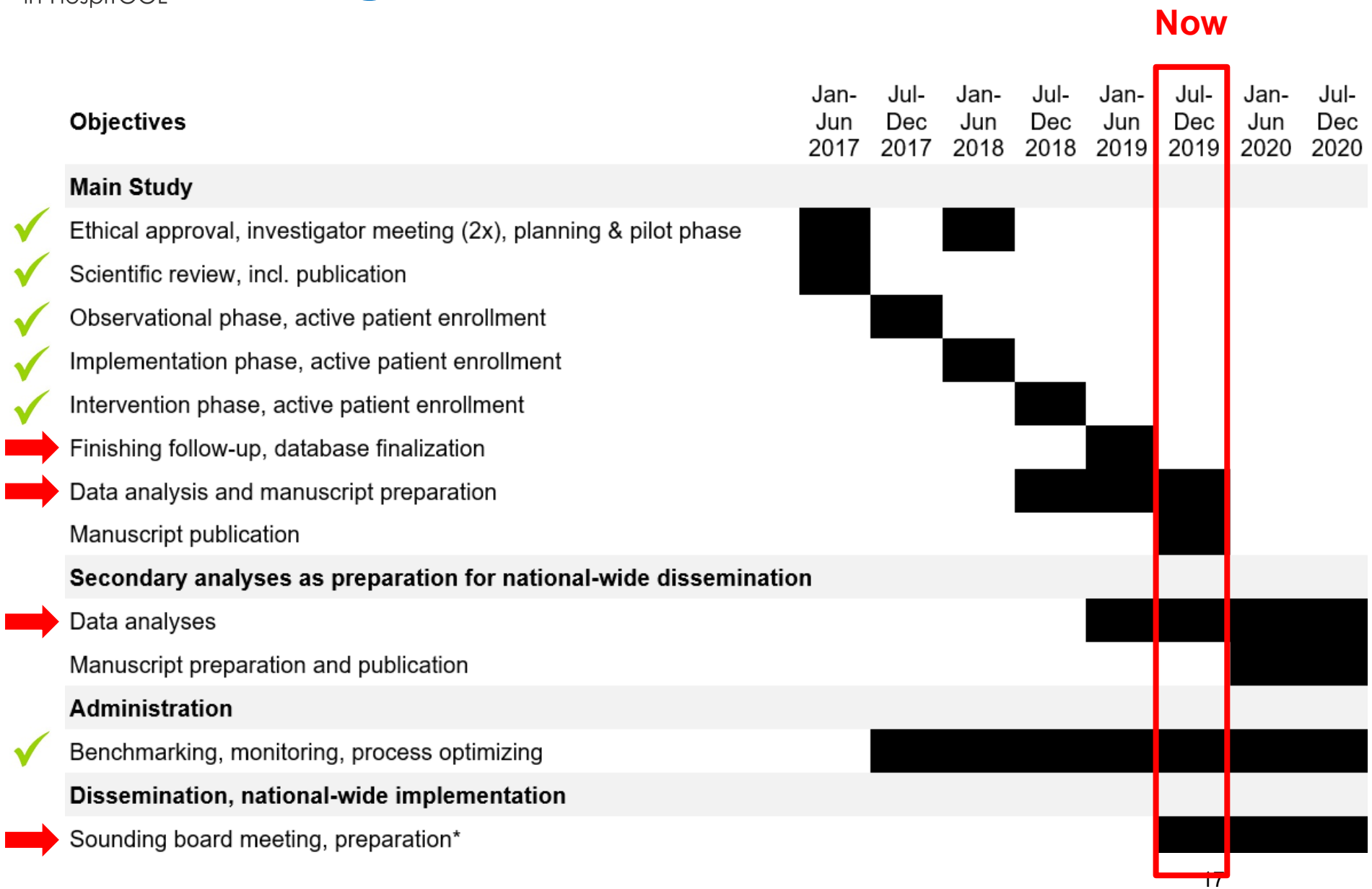
Progress of the scientific work



Original timetable from NRP74 grant application (2016)

In-HospiTOOL

Demographics – *InHospiTOOL* population

	Overall	Observation	Implementation	Intervention	p-value
Hospitalizations, n	30`738	11`979	9`927	8`832	
30-day interviews completed, n (%)	25`533 (83.1)	9`798 (81.8)	8`100 (81.6)	7`635 (86.4)	<0.001
Age, median (IQR)	72.0 (59.0, 82.0)	72.0 (59.0, 82.0)	72.0 (59.0, 82.0)	72.0 (58.0, 82.0)	0.39
Male gender, n (%)	16`007 (52.1)	6`245 (52.1)	5`163 (52.0)	4`599 (52.1)	0.98
30-day Mortality, n (%)	775 (2.6)	270 (2.5)	253 (2.6)	252 (2.7)	0.71

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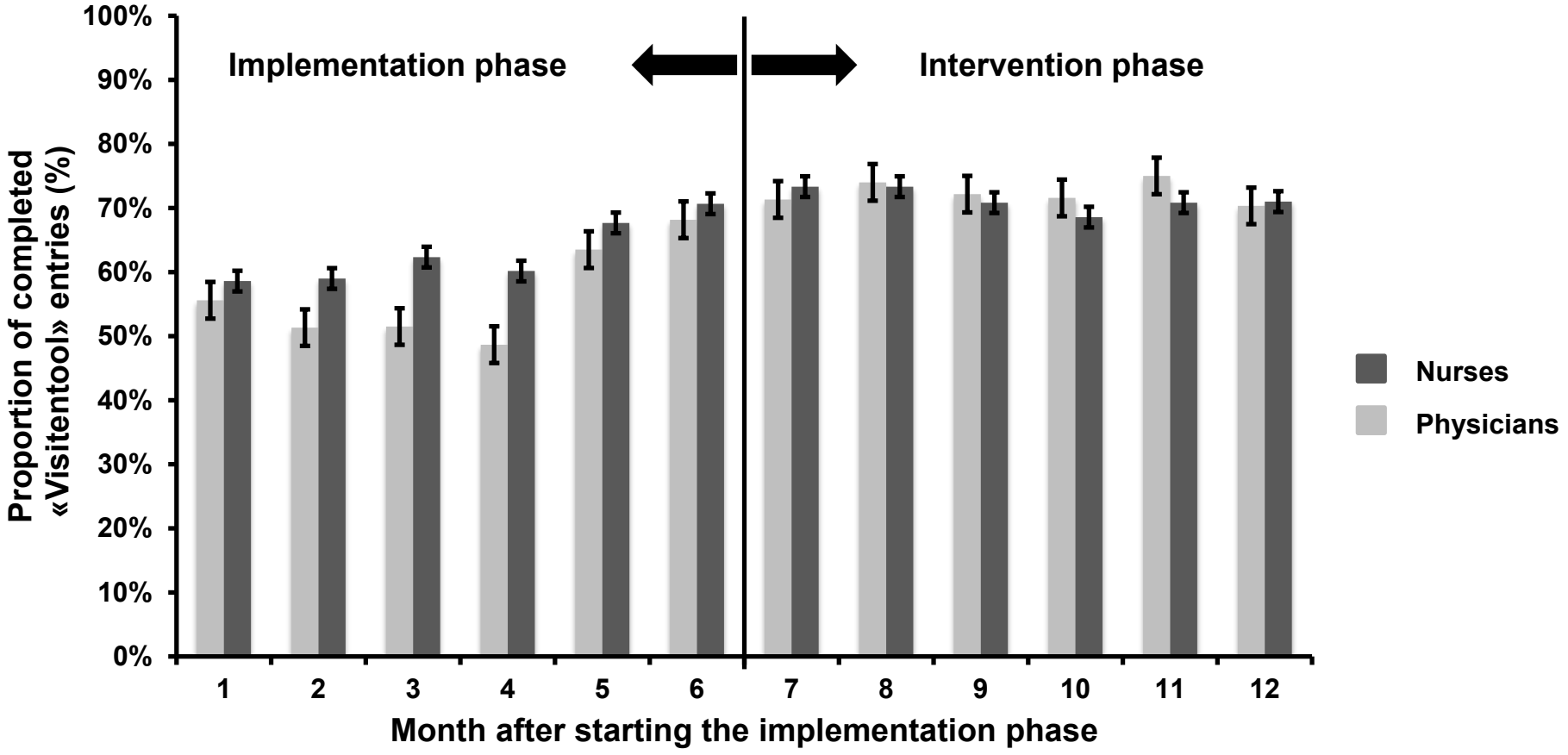
Proportion of completed “Visitentool” entries from physicians (A) and nurses (B) after starting the implementation phase



Compliance (Implementation vs. Intervention phase):

Nurses: 58.0 vs. 67.0%, $p<0.0001$

Physicians: 52.5 vs. 70.6%, $p<0.0001$

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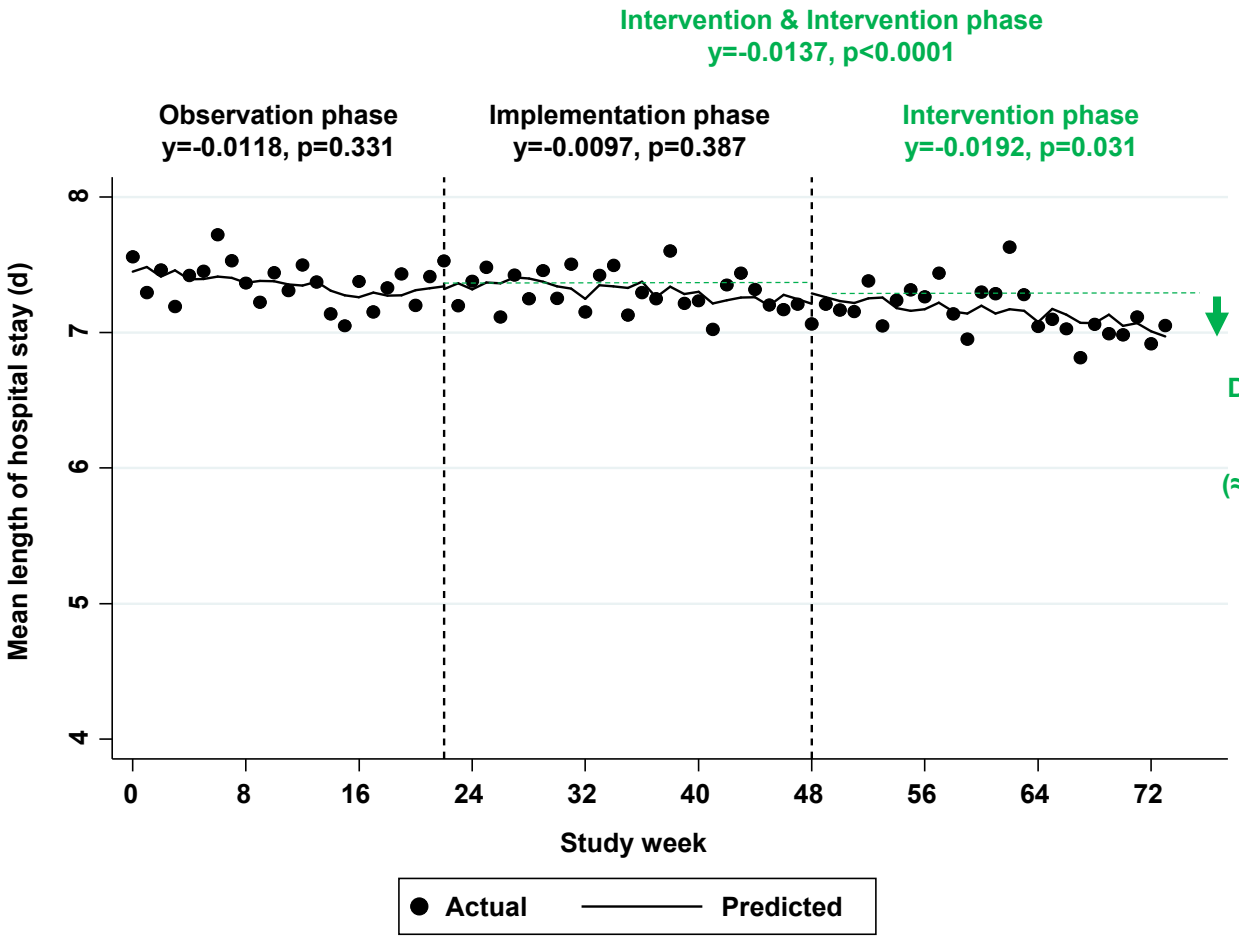
Time trends in risk-adjusted LOS

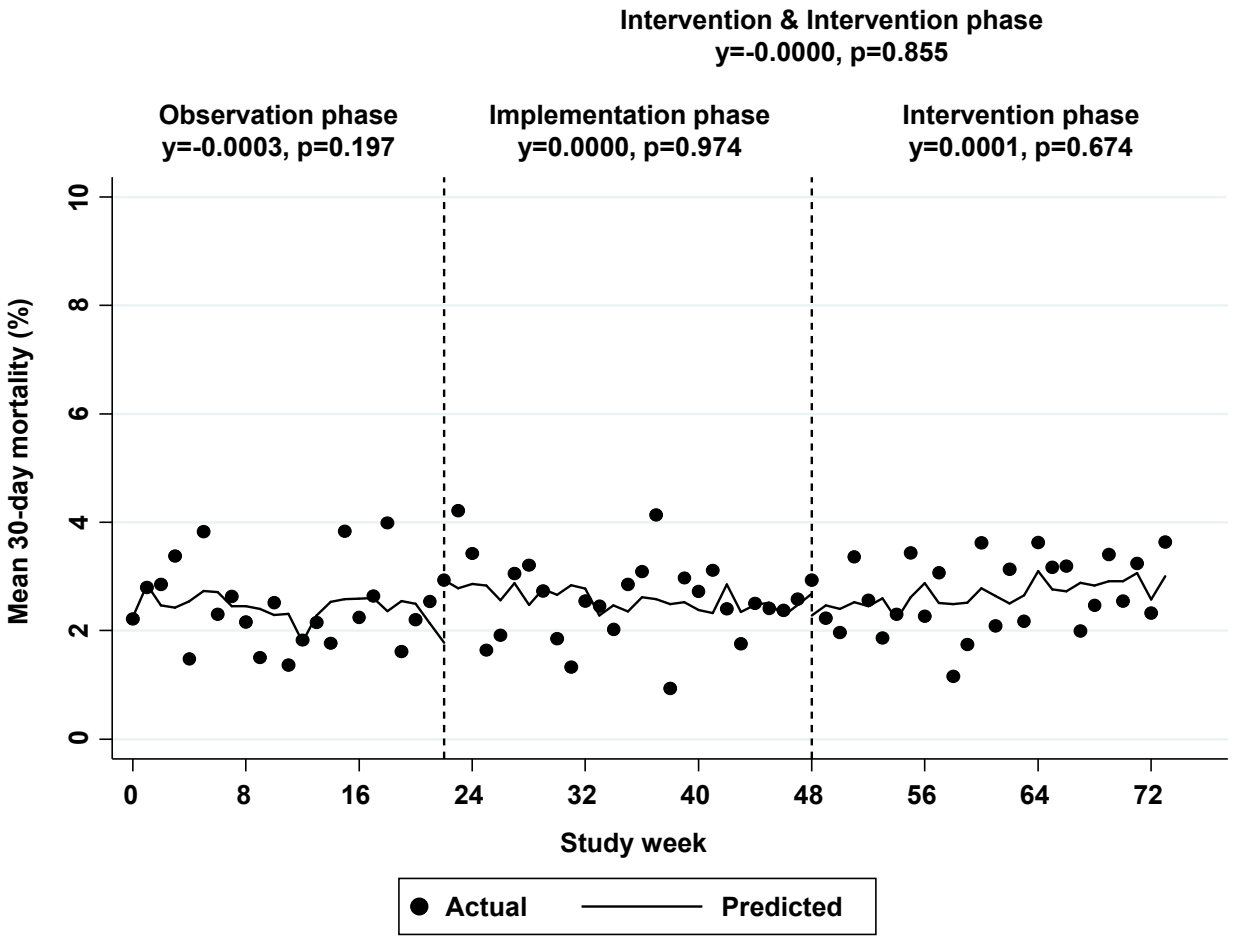


Intervention phase
Δ LOS -0.5d (in 6Mon.)

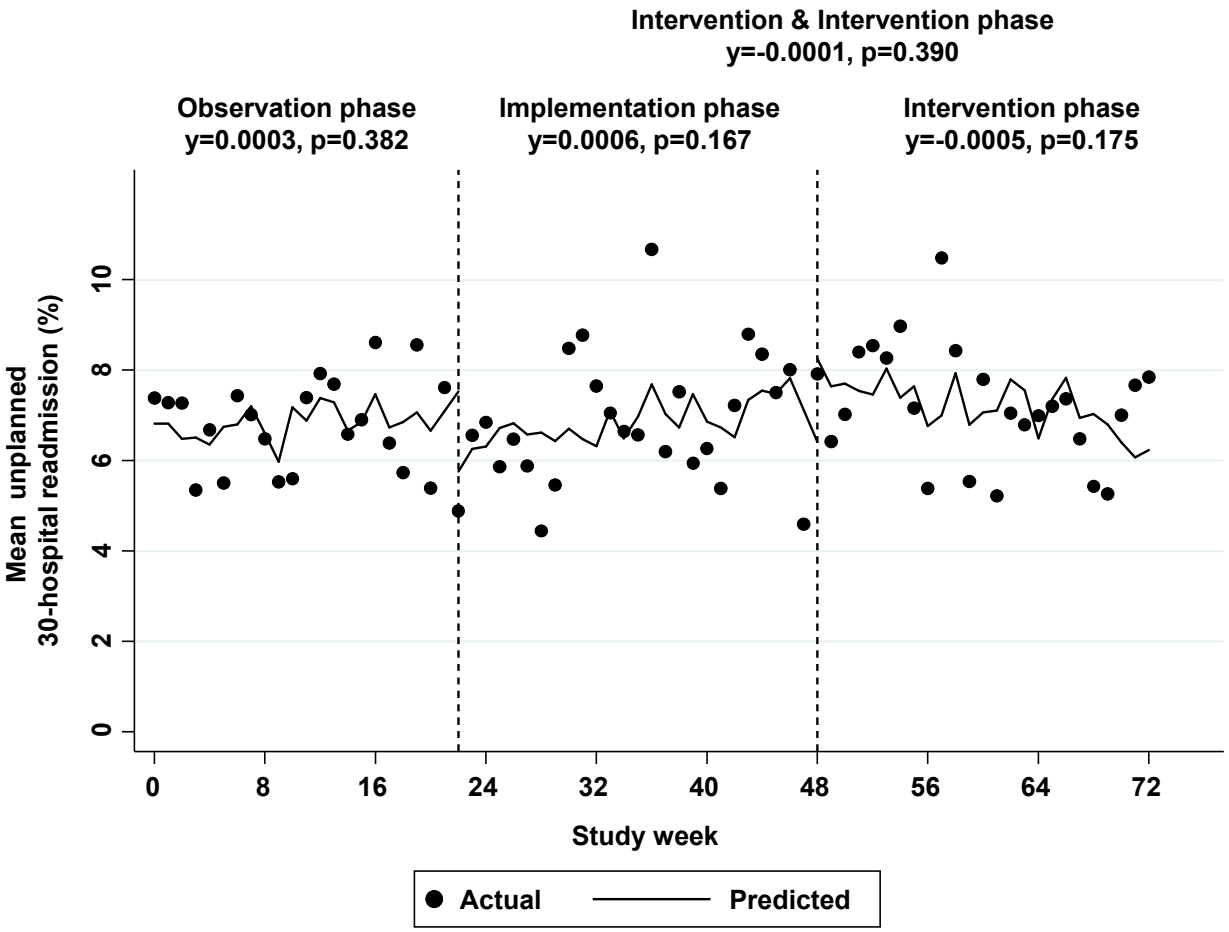
DRG CHF 1‘500.- / d LOS
→ Savings in CHF p.a.
≈ - 12‘000‘000.-
(≈16‘000 Pat x CHF -750.-)

In-HospiTOOL

Time trends in risk-adjusted mortality



Time trends in risk-adjusted 30-day readmission



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…indeed promising results, however data from control group (BFS) is still missing.

But already now of highest scientific interest…

Annals of Internal Medicine®

Dear Dr. Kutz and Colleagues,

I am writing as Editor-in-Chief of *Annals of Internal Medicine* to express our continued interest in considering for publication an article that reports on the primary outcomes of "Integrative hospital treatment in older patients to benchmark and improve outcome and length of stay – the In-HospiTOOL study," trial.

Strengths

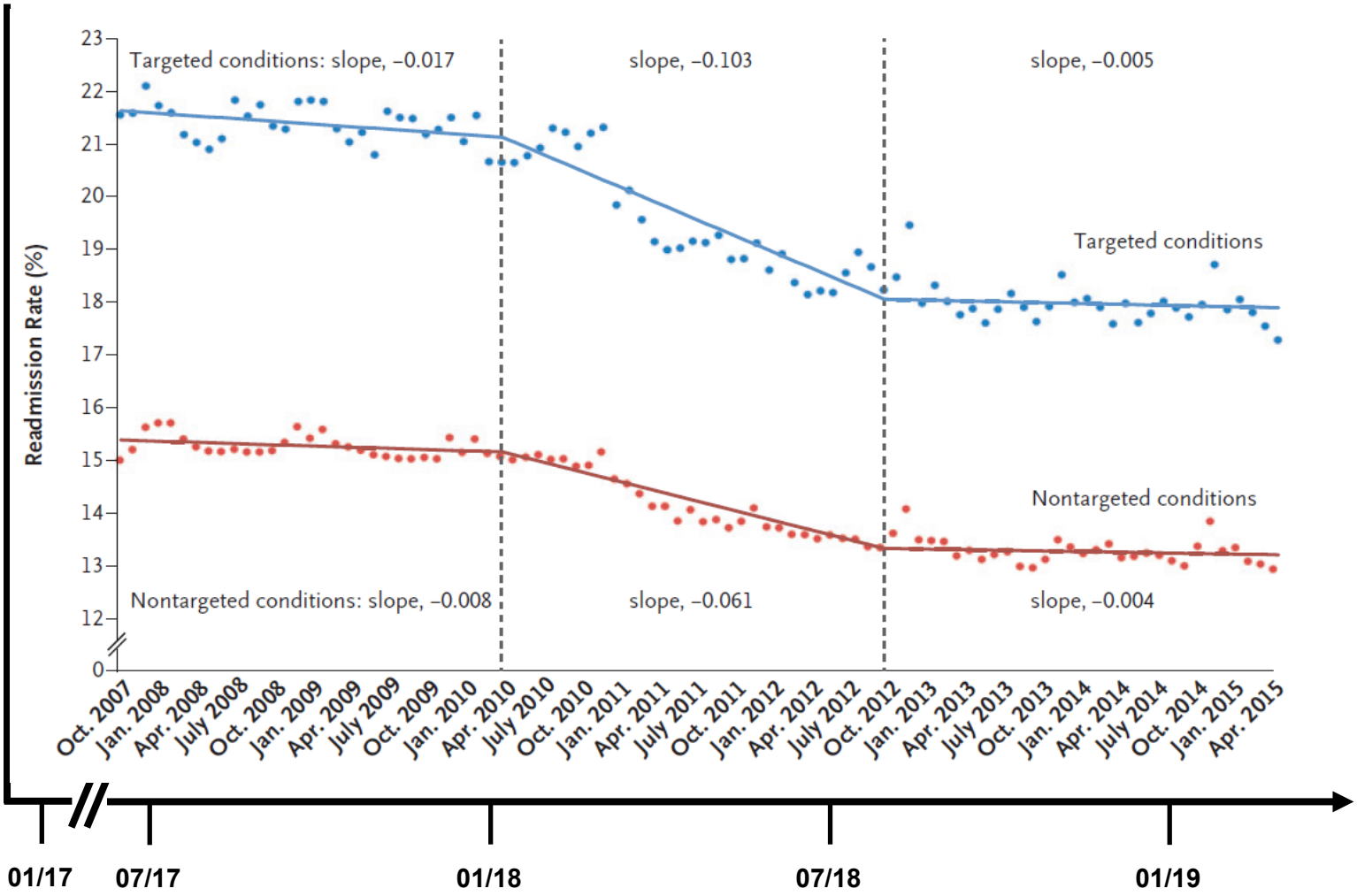
In-HospiTOOL

- **Large prospective** quasi-experimental study
- Successful recruitment of **7 secondary and tertiary Swiss hospitals**
- Build-up of a large interprofessional **Sounding Board**
- Management of **>30`000 patient follow-ups**
- **Up-to-date** with an **ambitious timetable**
- Heterogeneous hospital settings → **high generalizability** assumed

Weaknesses / Risks

- **Lack of randomization**
- Data from non-participating patients will serve as a **control group**; significantly **delayed data delivery** through Federal Offices (BFS / BAG)
- Bundled intervention → challenging to understand which part of our intervention shows clinical effects → potential **participation bias**

Design



*Analysen/Statistik: «Interrupted time series» Model adjustiert nach Diagnosen, prognostischen und demographischen Aspekten

**Umfang/Power: Konsekutiver Einschluss von 3`000-4`000 medizinischen Pat./6 Monate/Spital, → z.B. für 5 Spitäler: 30`000 Pat./y

Strategy for the implementation and valorisation of knowledge transfer (upon availability of final results)

Activity 1: Broaden the intellectual sounding board

- Next meeting in early 2020 to discuss study results and factors that should be considered in further improvement steps.
- Communication of the results to policymakers and disseminate the results broadly by hospital websites.
- Executive Circle, Chefärztekonferenz, SGAIM …Politics?

Activity 2: Dissemination of patient-oriented data between study sites to adapt transition processes

- Specific data exports to provide benchmarking to all study sites.
- To decide about how to best implement the elements and results into future and broader real-life practice in the study centers.
- 5/7 hospitals have decided to continue with In-HospiTOOL after study end (before knowing results ...)

Identification of synergy potentials to the program goals and synthesis

1. **Cost-Effectiveness of Interprofessional Health Care**
   Bested project of In-HospiTOOL, funded by the Federal Ministry of Health ("BAG"): PD Dr. Peter Berchtold **("college M Bern", BASS)**.
   → ongoing

2. "IPZ" – Inter-Professional Collaboration: "Success-critical Dimensions & Supportive Measures" funded by the Swiss Academy of Medical Sciences (**SAMW**). → ongoing

3. **Interaction with NRP 74 Projects**
   Nr. 3, Prof. D. A. Aujesky (geographic variation utilization of healthcare services, identification of over- & under use) **&**
   Nr. 16 Fr. Prof. B. Liebig (Coordination Palliative Care)

4. Patient-Centered Outcomes Research Institute (→ **PCORI**) Informed healthcare decisions to improve healthcare delivery & outcomes)
   → potential collaboration

Identify potential need of support by the Steering Committee

Original timetable from NRP74 grant application (2016)

Identify potential need of support by the Steering Committee

Current challenges foreseen

- **End Intervention Phase Jan 2019** (instead of Dec 2018)
  → Yearly reporting & availability of administrative data (BAG/BFS)
  → → BAG/BFS Data for 2019 available earliest Dec 2020
  → → → How to obtain “sub-yearly” BAG/BFS data ?

- **External validity on a international level**
  → Obtain international “BFS” data (EU, US…) ?

- **Political Networking with Stakeholders ?**

Demonstrate the benefits & impacts of the EHCL program

Beneficial for us (A. Kutz, D. Koch, A. Conca) and our project:

- **EHCL retreat about project management**
  - handle expectations of the stakeholders
  - to know how to lead a project team
- **Media training crash course**
  - learn how to create a key message for the media
  - understand the perspective of a journalist
- **Second Spark session – «from evidence to politics»**
  - Know how research topics become politically relevant
  - how to bring research results to politicians (F. Gutzwiler)

<u>And most importantly:</u>

- **Networking** with other (NFP74)-research groups

Thank you for your attention & most valuable support !