

# Transparent Monitoring-Benchmarking Intervention for the reduction of inappropriate Benzodiazepine prescriptions among Internal Medicine Departments, 2014-2017. A Multicenter Quasi-Experimental Longitudinal Study in a Network of Swiss Public Hospitals.

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## Background and Aims

Reducing the inappropriate prescription of benzodiazepines (BZD) in hospitalized patients represents a challenge for public healthcare systems worldwide. The Choosing Wisely Campaign recommends against the use of benzodiazepines in the elderly as first choice for insomnia, agitation or delirium. To date, no studies, have addressed the impact of a transparent monitoring-benchmarking method in promoting best practices in benzodiazepine prescriptions among inpatients. We aimed to determine whether a transparent monitoring benchmarking intervention could be effective in curbing benzodiazepine prescriptions.

## Methods

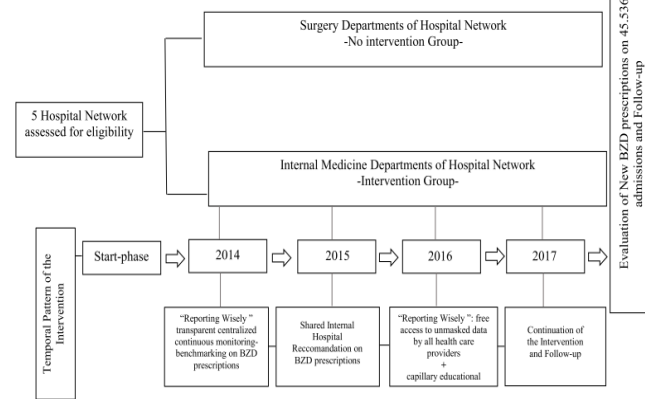
**Design.** Longitudinal, quasi-experimental, multicenter study.

**Setting.** A network of 5 southern Switzerland teaching hospitals.

**Participants.** Between July 1st, 2014, and June 30th, 2017, data of 45,536 hospital admissions, from Internal Medicine and Surgery Departments were analyzed.

**Intervention.** We implemented a transparent centralized continuous monitoring-benchmarking system, called "Reporting Wisely", able to collect, analyze and report data on benzodiazepine prescriptions. Hospital healthcare providers therefore had the opportunity to review the approach to new prescriptions in a proactive way. The intervention was limited to the Internal Medicine Departments.

**Main outcome measure.** The impact of the intervention on new benzodiazepine prescriptions at hospital discharge; hypothesizing a significant reduction of the prescription rate.



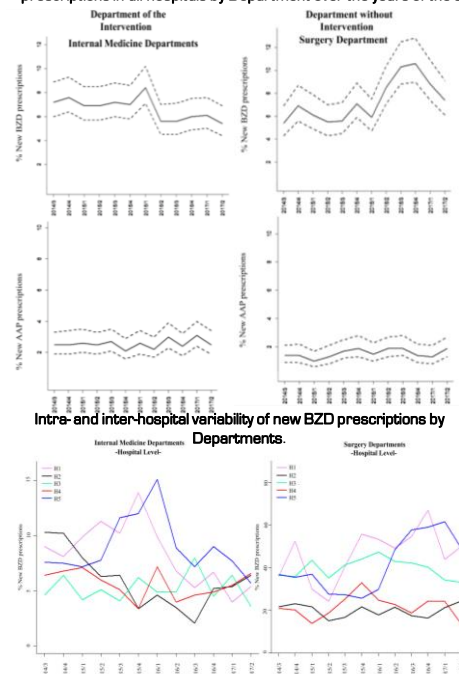
Flow Diagram of the study with the temporal pattern on the intervention

## Results

Characteristics of the study population by Departments for the study period (2014-2017).

	All Departments of the Hospital Network	Internal Medicine Departments	Surgery Departments
Total Admissions (n.)	45.536	26.618	18.918
H1, n (%)	4.584 (10.1)	3.028 (11.4)	1.556 (8.2)
H2, n (%)	8.351 (18.4)	5.044 (18.9)	3.307 (17.5)
H3, n (%)	11.241 (24.7)	6.625 (24.9)	4.416 (24.4)
H4, n (%)	10.473 (22.9)	5.868 (22.1)	4.605 (24.3)
H5, n (%)	10.887 (23.9)	6.053 (22.7)	4.934 (25.6)
Age, years (median, Q1-Q3)	72 (57-82)	75 (63-83)	67 (50-78)
Age groups, n (%)			
<65, y	16.780 (36.8)	7.680 (28.8)	9.100 (48.1)
65-80, y	15.815 (34.7)	9.820 (36.9)	5.995 (31.7)
>80, y	12.941 (28.5)	9.118 (34.3)	3.823 (20.2)
Gender, females (%)	23.051 (50.6)	13.290 (49.9)	9.761 (51.5)
Case-mix (median, Q1-Q3)	0.74 (0.51-1.1)	0.70 (0.51-0.92)	0.80 (0.54-1.49)
BZD admission, n (%)	11.615 (25.5)	8.291 (31.1)	3.324 (17.6)
BZD discharge, n (%)	12.562 (27.6)	8.543 (32.1)	4.019 (21.2)
New BZD prescriptions, n (%)	2.365 (6.9)	1.221 (4.8)	1.144 (6.4)
Atypical antipsychotic admission, n (%)	3.627 (7.9)	2.718 (10.2)	909 (4.8)
Atypical antipsychotic discharge, n (%)	4.017 (8.8)	2.956 (11.1)	1.061 (5.6)
New atypical antipsychotic prescriptions, n (%)	891 (1.9)	611 (2.3)	280 (1.5)

Trends in rates of new benzodiazepine and atypical antipsychotic prescriptions in all hospitals by Department over the years of the study



Intra- and inter-hospital variability of new BZD prescriptions by Departments.

Multivariate analysis of factors associated with receiving a new benzodiazepine

	Internal Medicine Department	OR (95% CI)	P Value
<b>Hospitals</b>			
H1	1 [Reference]		
H2	0.70 (0.57-0.80)		0.001
H3	0.61 (0.50-0.75)		<0.001
H4	0.65 (0.53-0.80)		<0.001
H5	1.07 (0.88-1.03)		0.482
<b>Year of the study</b>			
2014	1 [Reference]		
2015	0.92 (0.78-1.08)		0.313
2016	0.82 (0.69-0.97)		0.024
2017	0.77 (0.62-0.94)		0.011
<b>Gender</b>			
Female	1 [Reference]		
Male	0.97 (0.86-1.09)		0.614
Age <sup>a</sup>	0.99 (0.99-1.00)		<0.001
Case mix <sup>a</sup>	1.38 (1.28-1.48)		<0.001
<b>Department of Surgery</b>			
<b>Hospitals</b>			
H1	1 [Reference]		
H2	1.10 (0.85-1.43)		0.899
H3	1.34 (1.05-1.71)		0.017
H4	0.77 (0.60-1.00)		0.050
H5	1.25 (0.98-1.59)		0.077
<b>Year of the study</b>			
2014	1 [Reference]		
2015	0.99 (0.81-1.20)		0.894
2016	1.44 (1.19-1.74)		<0.001
2017	1.35 (1.08-1.67)		0.007
<b>Gender</b>			
Female	1 [Reference]		
Male	0.72 (0.63-0.81)		<0.001
Age <sup>a</sup>	1.02 (1.02-1.03)		<0.001
Case mix <sup>a</sup>	1.21 (1.14-1.29)		<0.001

## Conclusions

The rate of new BZD prescriptions at hospital discharge decreased over time after the implementation of a transparent monitoring-benchmarking intervention. These findings suggest that a similar approach could be effective in optimizing the in-hospital drug prescription strategy in other settings as well.