HealthPros

International Training Network for
Healthcare Performance Intelligence Professionals

POLICY RECOMMENDATIONS ON THE ROLE OF NUDGING FOR HEALTH CARE PERFORMANCE ASSESSMENT AGENCIES

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PREFACE

HealthPros is a H2020 Marie Sklodowska-Curie Innovative Training Network for Healthcare Performance Intelligence Professionals under grant agreement No 765141, running from January 2018–April 2022. Healthcare performance intelligence can be defined as a structured approach to acting on health policies, using knowledge and information generated through scientific methods and health data to systematically measure indicators of health system performance. The network set out with the aim to train a first generation of Healthcare Performance Intelligence Professionals (HealthPros Fellows) that can make effective use of available healthcare performance data in countries to improve integrated services delivery, patient engagement, equality in access to healthcare, health outcomes and reduce waste in healthcare.

Since 2018, HealthPros Fellows have completed innovative research and multidisciplinary training in Canada, Denmark, Germany, Hungary, Italy, the Netherlands and the United Kingdom. As part of their training, Fellows also completed secondments at partner organizations as an opportunity to obtain local guidance and conduct applied research.

Throughout the programme, HealthPros Fellows have worked to develop tools and implement methods to streamline healthcare performance measurement, develop and apply performance-based governance mechanisms and optimize the use of healthcare performance intelligence by different end-users. Topics explored through a healthcare performance intelligence lens in their work include: actionability of performance indicators; composite measures; integrated care; corporate governance tools; patient and citizen engagement; nudging; use of routine databases for performance improvement; and, long-term care. As the COVID-19 pandemic paralleled the HealthPros programme, many Fellows and the network at-large, sought opportunities to conduct a number of COVID-19-related studies at pace with the pandemic's changing context.

Outputs of the HealthPros programme have continuously been published as open access studies in international, peer-reviewed journals. Additionally, Fellows have actively contributed to webinars, conferences, the delivery of courses, policy dialogues, direct country support, and media engagements, among other types of dissemination to continuously share new findings throughout the programme.

This **Healthcare Performance Intelligence Series** represents the culmination of key research findings by the network into a collection of reports providing methodological, practical, and policy guidance. Reports in the series are tailored to different audiences, ranging from policy-makers, hospital

managers, clinicians, and the general public. The development of each report in the series has relied on close collaboration across the HealthPros network. The range of topics and resources making up this series includes the following:

- Practical experience with implementing disparity and composite measures in large-scale routine quality improvement work to support transferability to other HC systems (No. 1.2 2022)
- A practical guide towards actionable healthcare performance indicators: Selecting healthcare performance indicators that are fit for purpose and use for various stakeholders (No. 1.3 2022)
- Policy guidance on advancing the performance assessment of integrated healthcare systems (No. 1.4 2022)
- Policy guidance on the use of PREMs to improve health system performance (No. 2.2 2022)
- Policy summary report on the value of results-based tools in health care management-Lessons learned from COVID-19 dashboards (No. 2.3 2022)
- Business model for effectively involving patients in the financial decision-making of health insurance funds- A guide to health care insurers on fostering the engagement of citizens based on recent experiences in the Netherlands. (No. 2.4 2022)
- Policy summary report on best practices for linking financial incentives to health care performance at individual health care provider, institutional and regional level- A business case for value-based health care systems based on performance intelligence (No. 2.5 2022)
- Policy recommendations on the role of nudging for health care performance assessment agencies (current)

The full series of reports can be found online (https://www.healthpros-h2020.eu/). For questions related to the series or HealthPros network please contact Dionne Kringos, PhD (d.s.kringos@amsterdamumc.nl).

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1. Introduction

This policy brief aims at discussing how policy makers, managers, and employees in performance assessment agencies can account for the role of the human factor in healthcare decisions by taking stock of groundbreaking work on intuitive judgement and choice (Kahneman 2011; Kahneman et al. 2021) and nudging (Thaler and Sunstein 2008). Understanding the nuances of how professionals make sense of performance information holds the promise of improving service delivery. This policy brief, thus, targets policy makers, heads of healthcare organizations, and healthcare professionals across organizations alike.

This document summarizes relevant theories that practitioners may apply to real word situations and presents findings from empirical studies – with a special attention to projects conducted by HealthPros Fellows and experts in the partner Institutions – on the effective use of nudges to enhance the use of performance information (e.g., Belle & Cantarelli 2021; Belle, Cantarelli, Battaglio, & Barchielli *In progress*; Belle, Cantarelli, & Quattrone 2021; Belle, Cantarelli, & Wang *In progress*; Belle, Giacomelli, Nuti, & Vainieri, 2021; Gilmore & Belle *In progress*; Poldrugovac, Amuah, Wei-Randall, Sidhom, Morris, Allin, Klazinga, & Kringos *In progress*; Vainieri, Lungu, & Nuti 2018; Wang & Groene 2020; Willmington, Vainieri, & Seghieri *In progress*)

In particular, the document includes the following sections: (i) theory-driven behavioral insights to advance healthcare management and policy; (ii) empirical evidence about the effectiveness of behavioral economics-informed interventions in the context of performance information use in healthcare; and (iii) policy recommendations.

2. Behavioural insights into healthcare management and policy

2.1. Understanding how healthcare professionals make sense of performance information

The ability of healthcare systems to fulfill their mission is linked to healthcare professionals' behaviour and ability to make the best use of performance information. National health care performance assessment agencies as well as any institution that can evaluate organizational achievements play a key role in facilitating the implementation of this mission, factoring in the human factor of how professionals make sense of information, and benchmarking among healthcare systems at different governance levels. The appropriate use of performance information has an impact on the

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quality of and access to care, on the financial sustainability of operations of healthcare systems, and on performance improvement activities such as the adoption of technologies able to improve service delivery. That impact is both direct, in terms of appropriateness of clinical and institutional choices, and indirect, in terms of efficient and effective management and organizational decisions.

The effort to improve performance information use in healthcare is made even more urgent by evidence of low-value care, i.e. wasteful spending on unnecessary procedures that may eventually cause patient harm. In a report by Berwick and Hackbarth (2012), overutilization of low-value care is estimated to cost the United States healthcare system between 158 to 226 billion dollars in 2011. Despite monumental efforts made to develop measures, identify targets (Miller et al. 2018; Schwartz et al. 2014), and produce recommendations (Kerr, Kullgren, and Saini 2017), a clear gap exists in adoption of waste-reduction goals among stakeholders in the healthcare domain. Choosing Wisely, for instance, is a campaign that aims to reduce unnecessary care by synthesizing and disseminating recommendations and providing an avenue of conversation for patients and providers to discuss care appropriateness (Kerr, Kullgren, and Saini 2017). The urgency to improve performance information use in healthcare has also been highlighted by the worldwide spread of the COVID-19 pandemic, which urged policy makers and professionals to decide life or death.

2.2. Altering the context in which healthcare professionals make decisions is a viable and cost-effective tool to encourage desired behaviors

Extant behavioral theories and empirical evidence aims to encourage the uptake of desired behaviors shows that altering the context in which people make decisions is a viable and cost-effective alternative to traditional tools such as rewards and punishments (Kahneman 2021; Thaler and Sunstein 2021). Challenging the standard economics assumptions that decision makers are rational, able to optimize, capable of self-control, and self-interested, several decades of behavioral research have buttressed Simon's (1947, 1956, 1990) claim that individuals are endowed with bounded rationality, tend to find solutions that are satisfying rather than optimal, lack self-control, and can be genuinely other-oriented. The fact that deviations from rational decision-making tend to be systematic (Kahneman 2011; Kahneman and Tversky 1981) brings with it the possibility of strategically exploiting cognitive biases and the architecture of choices to nudging a better use of information (Thaler and Sunstein 2008). Rooted in libertarian paternalism, the *Nudge Theory* posits that decisions occur in a context where small variations in said environment can greatly influence final decisions without prohibiting any options nor significantly altering economic incentives (Thaler and Sunstein 2008, 2021). More specifically, "a choice architect has the responsibility for organizing the context in

which people make decisions. There are many parallels between choice architecture and more traditional forms of architecture. A crucial parallel is that there is no such thing as a "neutral" design (Thaler and Sunstein 2008, p.1). Latest developments on the understanding of flaws in human judgments demonstrate that bias and noise are different components of decision error. In particular, "some judgments are biased; they are systematically off target. Other judgments are noisy, as people who are expected to agree end up at very different points around the target" (Kahneman, Sibony, and Sunstein 2021, p. 9). Overcoming both bias and noise is quintessential to improve the quality of judgement and use of performance information across decisions in healthcare, from policy makers to frontline professionals.

2.3. Informed healthcare policy making: Applying behavioral insights to boost COVID-19 vaccination uptake

Based on the above mentioned evidence, in January 2021, the Italian National Agency for Regional Health Services (AGENAS) and the Management and Healthcare Laboratory of the Scuola Superiore Sant'Anna conducted a large-scale survey involving 12,322 Italian residents to (i) map the attitudes of the Italian population towards the vaccination against COVID-19 and the sources of information relating to the virus and (ii) investigate some behavioral causes that can lead to a deficit of implementation regarding the acceptance of the vaccination campaign against COVID-19. Results show that the odds to get vaccinated against COVID-19 increase when the vaccination site is more accessible, the effectiveness of the vaccine is larger, the time required to get vaccinated is shorter, the vaccination appointment is confirmed automatically and decrease when the risk of side effects is greater and the majority of people are against vaccination.

In an attempt to derive comprehensive implications for practice that are behaviorally-inspired, Thaler and Sunstein (2008) provide a mnemonic device that synthesizes six principles that good choice architects leverage upon to encourage desirable behaviors for human decision makers: NUDGES. This stands for

- provide iNcentives
- Understand mappings
- set Defaults
- Give feedback
- Expect error
- Structure complex choices.

The EAST mnemonic, then, was developed by the United Kingdom's Behavioural Insights Team (Cabinet Office, Behavioural Insights Team, 2014, p. 4). It suggests encouraging desired behaviors – such as the actual use of healthcare performance information – by making those:

- Easy
- Attractive
- Social
- Timely

Thirdly, Münscher and colleagues (2016) provide a taxonomy of choice architecture techniques targeting decision information, decision structure, and decision assistance. This taxonomy is centered on intervention design and is derived through an inductive approach from empirical evidence. Münscher et al. (2016) taxonomy has been used in the healthcare domain by Wang and Groene (2020) to synthesize the use and effectiveness of behavioral economics-informed interventions in changing physician behaviors as well as by Nagtegaal et al. (2019) to nudging healthcare professionals towards the use of evidence-based medicine.

3. Behavioural economics-informed interventions in the context of healthcare

This section presents a selection of studies on the effectiveness of incentives and behaviorally-inspired interventions for factoring in the human factor in decision information, decision structure, and decision assistance in healthcare.

3.1. Incentives - Monetary and reputational incentives might encourage desired behaviors under certain conditions.

The use of monetary and reputational incentives to encourage desired behaviors is not threatened by the emergence of behavioral science. **Monetary and non-monetary incentives** remain a useful tool in the arsenal of decision makers because they can be effective in the public sector under certain conditions. As to reputational incentives, Bevan, Evans, and Nuti (2018) explore what motivates improved healthcare performance through reciprocal altruism, whereby reputational effects are nudged through public reporting of benchmarking of performance. They find that reputations count. More precisely, in a natural experiment across countries, naming and shaming

conveyed to publicly available benchmarking among organizations improved poor performance whereas competitive benchmarking and peer learning of good practices further improved good performance. As to monetary incentives, considering the healthcare performance of two Italian Regions, one of which introduced financial rewards for general managers whereas the other did not, whom, how, and how much to reward general managers are not relevant in the success of pay-for-performance schemes. On the other hand, the number (how many) and the type (what) of targets linked to general managers' monetary rewards might influence performance improvements (Vainieri, Lungu, and Nuti 2018). Pay-for-performance scheme are also in place for general practitioners in Tuscany. However, the extent of the payment and the choice of indicators used for the monetary incentives scheme largely depend on the decisions of local policymakers and health professionals. This means that the scope of indicators for which general practitioners are incentivized vary by group practice and are likely to represent only a fraction of the general practitioners' salary (Willmington, Vainieri, and Seghieri in progress).

3.2. Decision information - The way in which information is translated, made visible, and compared influence decisions systematically.

In the taxonomy of Münscher and colleagues (2016), nudging decision information implies changing the way in which data are presented without altering the arrangement of alternatives. One technique to do so is **translating information** for decision makers. In this domain, a promising and currently unexplored area of inquiry deals with the relative impact of statistical versus episodic evidence in affecting professionals' understanding of information. In a research project that is undergoing, Gilmore and Belle investigate the impact of different presentation options for healthcare performance data. They use synthetic Patient Reported Experience data, presented differently in six experimental arms with the same baseline statistical performance, with different episodic additions to each (positive and negative, quantitative and qualitative) and one negatively framed arm. Healthcare professionals were asked to rate the performance of the hospital based on this data. The addition of qualitative episodic information had a greater effect than quantitative episodic addition, and the negative additions had a greater effect on mean scores than the positive additions. Thus, the inclusion of episodic information alongside statistical performance information can significantly affect health professionals' understanding of performance. Thus, the decisions about which episodic data to include in the reporting of performance information is not neutral.

Another nudging technique that targets decision information is **making it visible**, aware that how information is presented can influence understanding and recall. In a randomized controlled trial with

902 public hospital department heads in Italy, managers' perceived understanding and objective recall of performance information - that was kept identical - depend on its graphical representation (Belle et al. 2021). In an online survey with about 1,200 clinicians, making cost information visible have an impact on prescription decisions. Specifically, compared to a control condition, the mean probability of prescribing a test decreases by 7.35 percentage points when professionals are informed that the test is very expensive and increases by 7.28 percentage points when physicians are made aware that the test is not very expensive (Belle, Cantarelli, and Wang in progress).

As people are psychologically inclined "to do what most people actually do" (Thaler and Sunstein 2008, 191), **social comparison** can be another cost-effective intervention to nudge desirable choices. For instance, prescribers can be sent regular feedback reports illustrating their performance and prescriptions relative to peers, thus providing a social reference point. A national-scale randomized controlled trial conducted on United Kingdom general practitioners found that "providing a low-cost mail-based intervention incorporating social norm feedback on high antibiotic use consistently reduce[d] such use over a 6-month period" (Hallsworth et al. 2016). An experiment with about 18,000 healthcare professionals reveals that public organizations with high vaccination coverage rates can promote vaccination by informing their employees that the majority of their colleagues get the flu shot (Belle and Cantarelli 2021). Previous research has shown that social comparison decreased inappropriate antibiotic prescribing rates by 5.2 percentage points compared to a no intervention group (Meeker et al. 2016). In the same domain, Willmington and colleagues (in progress) analyse the variation of antibiotic prescribing at different levels of governance within Tuscany's primary care. In Tuscany, general practitioners are affiliated to one of the Region's 116 group practices, which in turn are distributed across 26 local health districts. The results suggests that most of the variation in antibiotic prescribing is due to differences between general practitioners themselves (75% to 98%) as opposed to the influences exerted by their peers or institutional mechanisms. In a randomized online study, Belle et al. (in progress) investigates the difference in the probability of prescribing a drug between subjects exposed to a target on the number of prescriptions for the drug and their counterparts informed that there is no target on the number of prescriptions, separately for two levels of social comparison, namely one in which the respondent has a high prescription rate for that drug compared to colleagues and one in which (s)he has a low prescription rate. Relative to the low prescription rate group, the decline in the average probability of prescribing a drug caused by the target is 13.11 greater for subjects in the high individual prescription rate group. The impact of publication of indicators on performance is also a relevant area of ongoing research in this realm. Poldrugovac et al. (in progress) analysed the trends of 16 indicators between 2011 and 2018 focusing on long-term care in Canada. Eight of these indicators were made public in 2015. The

results suggest that public reporting likely had an impact on improvement in facilities with the lowest performance and in those that were not on an improvement trajectory already prior to publication.

3.3. Decision structure – Altering defaults, modifying the effort required to select a certain option, changing the range or compositions of options, or changing option consequences influence healthcare professionals predictably.

Nudging decision structure implies changing the arrangement of alternatives, such as through **modifying choice defaults** (Münscher et al. 2016). A pre-post intervention study demonstrates that lowering prescription defaults for postoperative opioids from 30 to 12 pills in the electronic health records decreases the number of opioids prescribed by more than 15% across an entire health system (Chiu et al. 2018). A pre-post intervention study conducted among all specialties across an entire Health System shows that the overall generic prescribing rate increases from 75.3% to 98.4% by making the generic equivalent medication the default option in the electronic health records used by physicians (Patel et al. 2016). Belle and colleagues' (in progress) randomized controlled trial with 5,303 public healthcare professionals explore the impact of defaults - either correct or incorrect - on workers' knowledge of guidelines. In an online test about the appropriate use of gloves, prepopulating incorrect answers that respondents were asked to double check significantly decreased test scores and prepopulating correct answers did the opposite. The negative impact of incorrect default answers significantly outweighed the positive effect of correct default answers.

Another technique that choice architects can leverage to structure decisions is **changing the effort required to select a given option**. Accountable justification is an intervention whereby prescribers are prompted to provide a justification on the electronic prescribing system when a potentially inappropriate antibiotic prescription is entered. Previous research has shown that accountable justification effectively decreased inappropriate antibiotic prescribing rates by 7 percentage points compared to a control group (Meeker et al. 2016). To the contrary, however, an ongoing project by Belle, Cantarelli and Wang shows that asking medical doctors to provide a justification to prescribe a test increase the average probability that they would do so.

Changing the range or composition of options is another tool in the arsenal of healthcare policy makers and professionals interested in structuring decisions for the better. A randomized experiment conducted by Cantarelli, Belle and Belardinelli (2018) on a sample of nurses reveals that the addition of a decoy option reverses the preferences between two diagnostic devices.

In the category of decision structure, a last technique that policy maker can use is to **change option consequences**. For instance, a study with about 1,200 clinicians illustrates that the typology of professionals suggesting to prescribe a drug has a significant impact on their propensity to prescribe that drug. More precisely, when the suggestion is made by a pharma representative, the average probability of prescribing is lower by 10.07 and by 9.79 percentage points compared to when the suggestion is made by a pharmacist in the organization and a colleague in the organization, respectively (Belle, Cantarelli, and Wang in progress).

3.4. Decision assistance – Providing timely reminders and facilitating commitments might be effective in closing the intention-behavior gap

In the taxonomy of Münscher et al. (2016), interventions that target decision assistance are meant to closing the intention-behavior gap. In this regard, accompanying the integration of routine databases and disease registries provides unique information to monitor and evaluate the efficacy of health policy interventions on specific populations and outcomes. Work on the European Best Information Through Regional Outcomes in Diabetes network demonstrates that distinct national registries can be homogenized through a common data dictionary or ontology, such as the Data Collection Reference Guide for Type 1 and Type 2 Diabetes from the International Consortium of Health Outcome Measurements. Once database columns have been mapped to their relevant name and structure, automated data extraction algorithms can work on predefined columns based on a common benchmarking target through a traditional patient/population, intervention, comparison and outcomes approach (e.g. effect of organizational arrangements on preventing lower extremity amputations in people with type 2 diabetes).

Providing reminders has also proved useful in assisting decisions. In the context of a test on the appropriate use of gloves, reminding nurses about extant regulations right before the test - either through an excerpt from the actual government guidelines or a leaflet - increased test scores. The visual reminder tended to be more effective than the textual one (Belle et al. in progress). Through the same logic, reminding the potential benefits that one can have on others – namely family, friends, and patients – by getting immunized significantly increases healthcare professionals' intention to get a flu shot and to advocate immunization among their colleagues (Belle, Cantarelli, and Quattrone 2021).

Facilitating commitment also qualifies as a usable technique geared toward assisting decisions for the better. Meeker et al. (2014) investigate the use of a nudge based on the principle of public commitment to encourage the reduction of inappropriate antibiotic prescription for acute respiratory

infections. A poster-sized letters stating the commitment to avoid inappropriate antibiotic prescribing that was hanged in outpatient clinics resulted in a 19.7 absolute percentage reduction in inappropriate antibiotic prescribing rate relative to control.

4. Policy recommendations- use interventions that encourage desirable behaviour for the better

Any public or private agencies or institutions that are positioned to collect health care performance information should more systematically leverage on the *Nudge Theory* (Thaler and Sunstein 2008, 2021) and its applications by exerting libertarian paternalism toward an appropriate use of performance information. In other words, they should **simultaneously preserve end users' freedom of choice and use interventions that influence behaviors and decisions for the better**. Furthermore, they should take the lead in **recognizing and measuring *Noise*** in judgment errors because "in real-world decisions, the amount of noise is often scandalously high" (Kahneman, Sibony, and Sunstein 2021, p. 10).

Building on the insights explained above, we make the following policy recommendations.

- Link **monetary and reputational incentives** to objectively measurable targets that are rigorously estimated and made publicly available.
- **Design the architecture of reporting systems** so to put relevant information at eye level. On the one hand, **maximize the ease of access and the timeliness** of performance information. On the other hand, **reduce cognitive and administrative burden** ensuring consistency in the way in which performance information is presented over time.
- Ask the leadership at different levels of the healthcare systems to
  - **identify priorities** to address performance shortcomings resulting from information systems
  - **publicly commit to a limited number of specific improvement actions** that they will be held accountable for.
- Design information systems to **maximize understandability and recall.**
- **Encourage benchmarking and social comparisons.** In particular, at the national level, use public benchmarking to improve poor performance through naming and shaming. At the sub-national level, use competitive benchmarking and peer learning to enhance good performance (Bevan, Evans, and Nuti 2019). Benchmarks and comparisons across organizations bears side effects on the citizens front too. In fact, by looking at the results of benchmarking and social comparisons, they can build informed trust in health care systems and health service delivery.

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