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**INTRODUCTION – THE UNIVERSAL CHALLENGE OF MEDICATION ADHERENCE**

# The Global Challenge of Medication Adherence

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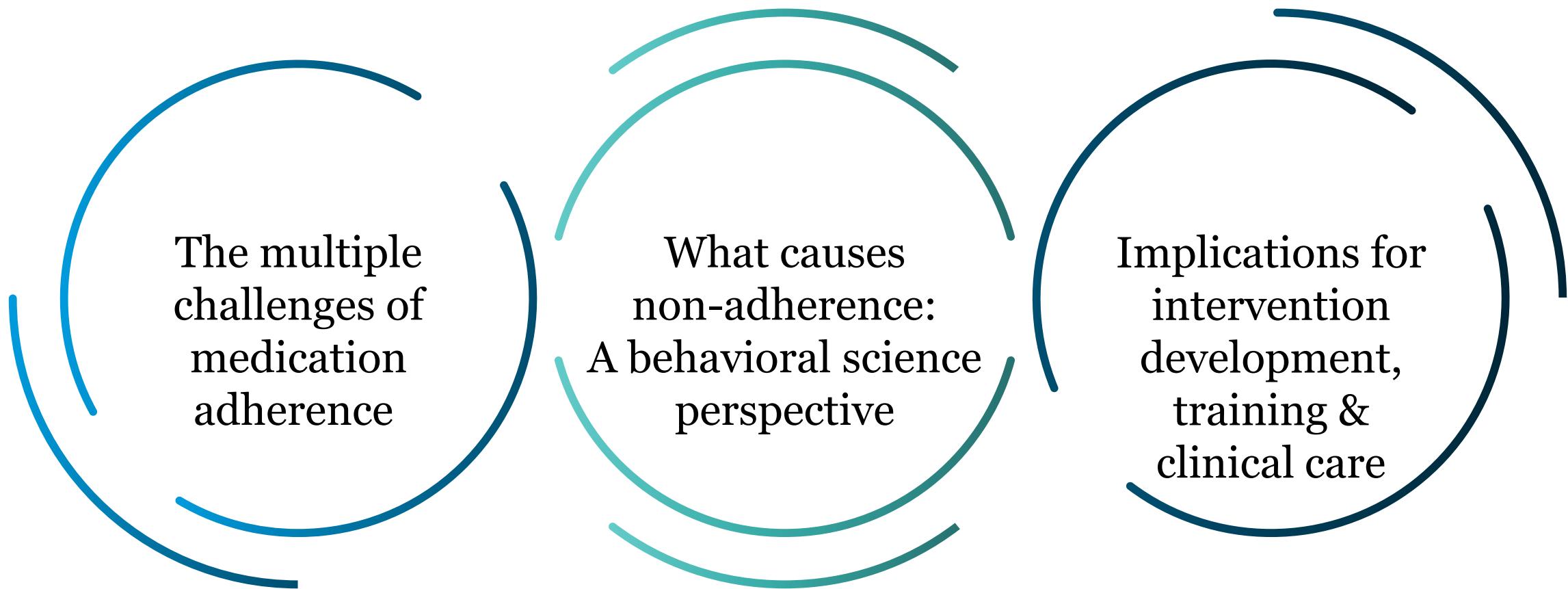
# Disclosures



I have presented talks for  
Abbvie, Abbott, Bayer,  
Chiesi, Boehringer  
Ingelheim, Roche  
and Merck.

I received a PhD research  
grant from Merck, and  
serve on the Behavioral  
Science Advisory Board  
for Sanofi

# Outline



# Behavioral Science and Treatment Adherence



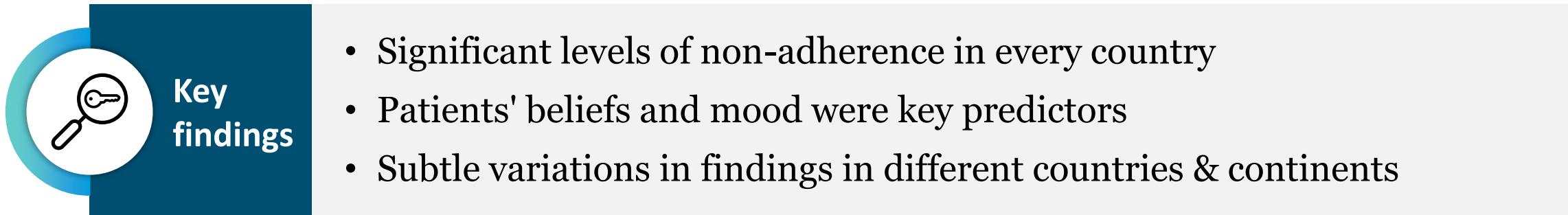
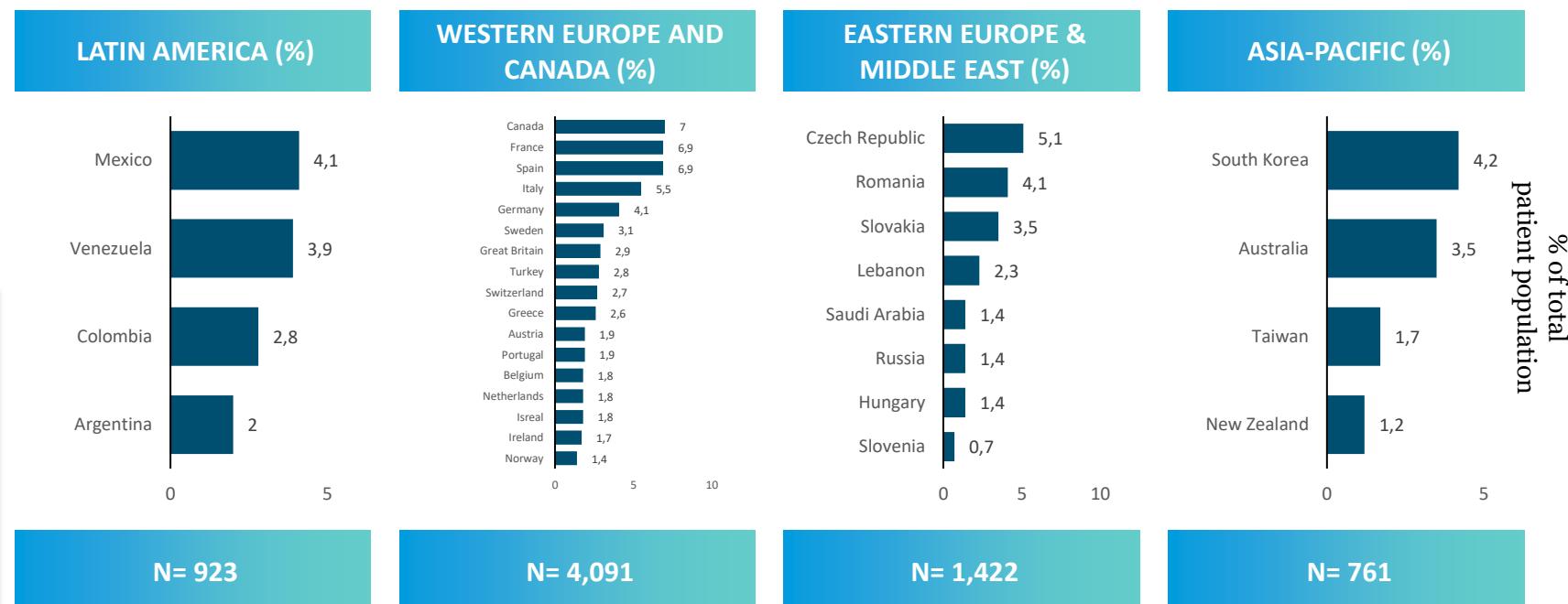
**Behavioral science is used to**

- Investigate the nature, extent, causes and consequences of non-adherence
- Develop methods for assessing the nature and causes of non-adherence
- Develop/adapt theoretical frameworks for understanding/explaining adherence
- Develop theory-based interventions for improving the adherence related behavior of patients, healthcare providers and carers
- Guide the design of digital interventions



A global problem?

# ALIGN STUDY (Michetti et al, 2017)



Michetti P, Weinman J, Mrowietz U, et al. Impact of Treatment-Related Beliefs on Medication Adherence in Immune-Mediated Inflammatory Diseases: Results of the Global ALIGN Study. *Adv Ther*. 2017;34(1):91-108

# The extent of non-adherence



## WHO REPORT ON ADHERENCE (2003)<sup>1</sup>

- Estimated that 30 - 50% medicines prescribed for long term illnesses are not taken as directed



## OECD HEALTH WORKING PAPER (2018)<sup>2</sup>

- Poor adherence contributes to 200,000 premature deaths in Europe per year
- Estimated annual cost : EUR 125 billion in Europe
- 4-31% never fill first prescription
- Of those that get meds, only 50-70% adhere regularly
- Less than half of these persist for two years<sup>2</sup>

1. Sabate, E . (2003) Adherence to long-term therapies : evidence for action. Geneva : World Health Organization.

2. Khan, R. and K. Socha-Dietrich (2018), Investing in medication adherence improves health outcomes and health system efficiency: Adherence to medicines for diabetes, hypertension, and hyperlipidaemia, *OECD Health Working Papers*, No. 105, OECD Publishing, Paris

# Economic impact of medication nonadherence by disease groups: a systematic review



79 individual studies assessing the cost of medication non-adherence across 14 disease groups were included



Wide-scoping cost variations were reported, with lower levels of adherence associated with higher total costs



The annual adjusted disease-specific economic cost of non-adherence per person ranged from \$949 to \$44,190 (in 2015 US\$)



Costs attributed to 'all causes' non-adherence ranged from \$5,271 to \$52,341

# WHY ?



**Drivers of patient behavior**

1



Health care professional behavior

2



Healthcare system factors

3



# Early explanations



Early theories based on idea that non-adherence was result of poor communication & subsequent effects on patient understanding and memory.



Early interventions mainly based on information provision, and/or reminders and these are still used <sup>1</sup>



Do these work? – only in those who are motivated

1. Choudhry NK, Krumme AA, Ercole PM, et al. Effect of Reminder Devices on Medication Adherence: The REMIND Randomized Clinical Trial. *JAMA Intern Med.* 2017

# More recent explanations

## RECOGNITION OF 3 PHASES OF ADHERENCE<sup>1</sup>



A very large number of potentially modifiable factors cause non-adherence<sup>2</sup>.

## HOW TO CLASSIFY THESE?

Modifiable  
v  
Unmodifiable

Intentional  
v  
Unintentional

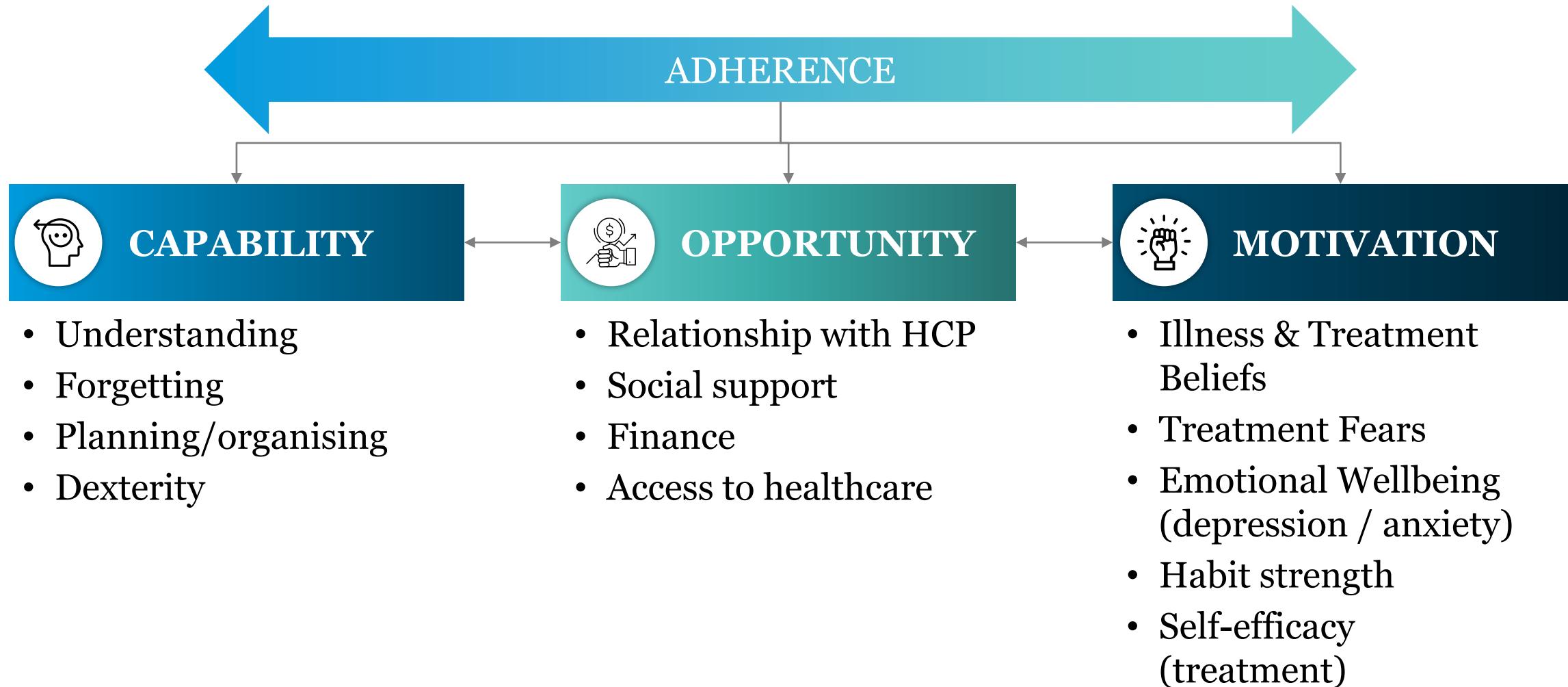
Perceptions  
v  
Practicalities

Capability/  
Opportunity/  
Motivation  
(COM-B)

1. Vrijens B, De Geest S, Hughes DA, et al. A new taxonomy for describing and defining adherence to medications. *Br J Clin Pharmacol.* 2012.

2. Kardas P, Lewek P, Matyjaszczyk M. Determinants of patient adherence: a review of systematic reviews. *Front Pharmacol.* 2013 Jul 25;4:91.

# COM-B Factors related to non-adherence



Jackson C, Eliasson L, Barber N & Weinman J (2014). Applying COM-B to medication adherence: a suggested framework for research and interventions. *The European Health Psychologist*. [http://www.ehps.net/index.php?option=com\\_content&view=article&id=302&Itemid=323](http://www.ehps.net/index.php?option=com_content&view=article&id=302&Itemid=323) [Accessed October 2021]

# Patient Factors - Summary



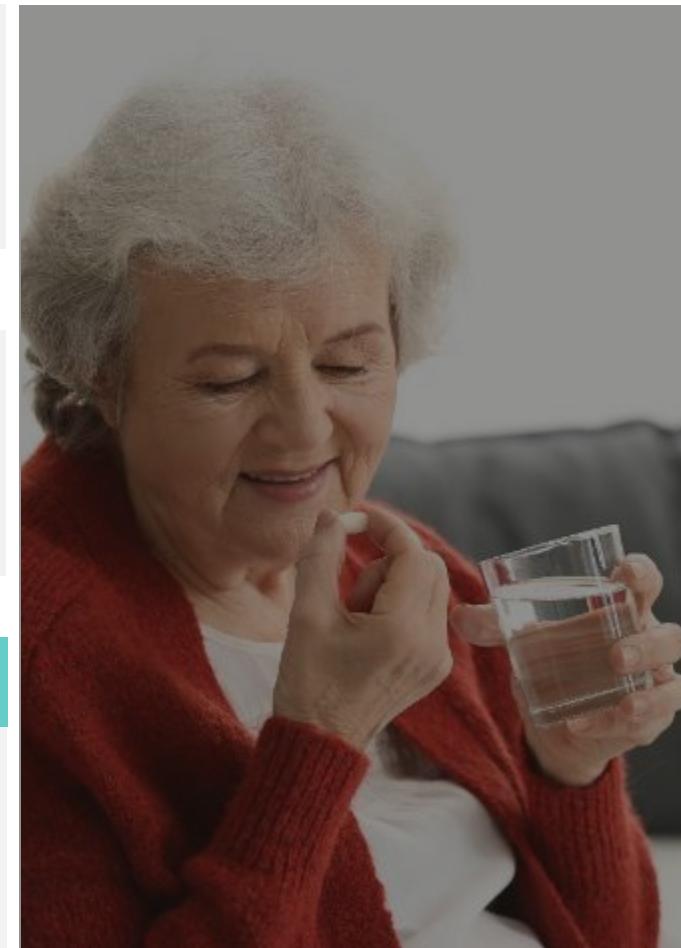
Very many factors have been found to influence adherence  
<sup>1</sup>



Large variation in the causes of non-adherence between patients and within patients over time

## A KEY CHALLENGE

Important to identify the reasons for each patient and tailoring interventions to these



1. Kardas P, Lewek P, Matyjaszczyk M. Determinants of patient adherence: a review of systematic reviews. *Front Pharmacol.* 2013 Jul 25;4:91.

# WHY ?



Drivers of patient behavior



## Health care professional behavior



Healthcare system factors

1

2

3



# Healthcare professionals (HCPs) and Adherence



Lack of awareness of extent of problem <sup>1</sup>

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Often do not check adherence (when treatment is not working)

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If adherence is checked – then question is asked in way which results in “false” patient response <sup>2</sup>

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No better than chance at rating adherence of individual patients

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Have an optimistic bias

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Lack of “ownership” in dealing with the problem <sup>1</sup>

1.Khan, R. and K. Socha-Dietrich (2018), Investing in medication adherence improves health outcomes and health system efficiency: Adherence to medicines for diabetes, hypertension, and hyperlipidaemia, *OECD Health Working Papers*, No. 105, OECD Publishing, Paris; 2.Engel T et al.(2017) Re-phrasing the question : A simple tool for evaluation of adherence to therapy in patients with inflammatory bowel disease. *United European Gastroenterology Journal*, 5, 6, 880 - 886

# WHY ?



Drivers of patient behavior

1



Health care professional behavior

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**Healthcare system factors**

3



# Healthcare system barriers to managing non-adherence in routine care (OECD, 2018)



The problem of poor adherence to medication has generally been overlooked and rarely explicitly included in national health policy agendas.

Consequently, few OECD countries routinely measure rates of adherence to medication.

Even fewer use those measurements to systematically incentivize improvements in adherence and health outcomes.

# The way ahead: Overcoming the barriers

NEED TO TARGET THE BARRIERS, WHICH CURRENTLY EXIST FOR :



# HCP barriers to managing non-adherence in routine care



- Outside their remit “Not my job”
- Underestimate prevalence
- Approach non-adherence in a “non-friendly” manner
- Ill-equipped to manage the reasons underlying non-adherence
- Lack of time in routine appointments

# Patient barriers to managing non-adherence in routine care



- Hiding non-adherence from the clinician
- Not wishing to disappoint or get “told-off”
- Defensive - in response to direct questioning re adherence
- Motivational and opportunity factors rarely addressed

# Implications for intervention development, training & clinical care



Need to increase awareness of the extent and effect of non-adherence to medicines and other advice<sup>1</sup> – “a major public health problem”.



Need to use patient friendly/collaborative ways of asking about adherence in consultations.



Need to be able to identify specific reasons for each patient and tailor appropriate adherence support interventions to these .



Need TRAINING and TOOLS (e.g., a:care)

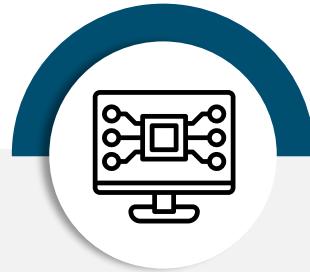


1.Khan, R. and K. Socha-Dietrich (2018), Investing in medication adherence improves health outcomes and health system efficiency: Adherence to medicines for diabetes, hypertension, and hyperlipidaemia, *OECD Health Working Papers*, No. 105, OECD Publishing, Paris.

# The future



**Digital interventions  
(with & without AI)<sup>1,2</sup>**



**Digital/HCP hybrid  
systems.**



**More sophisticated  
interventions based on:**

- In-depth understanding of the individual drivers of non-adherence
- Application of personalized, effective behavior change interventions

1. Babel R et al. AI solutions to increase medication adherence in patients with non-communicable diseases, *Frontiers in Digital Health*, in press. 2021 June;  
2. Zhao M, Hoti K, Wang H, Raghu A, Kataibi D. Assessment of medication self-administration using artificial intelligence. *Nat Med*. 2021 Apr



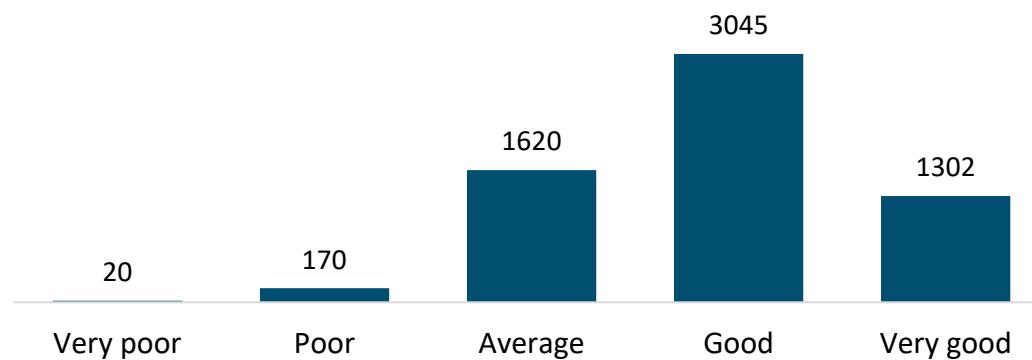
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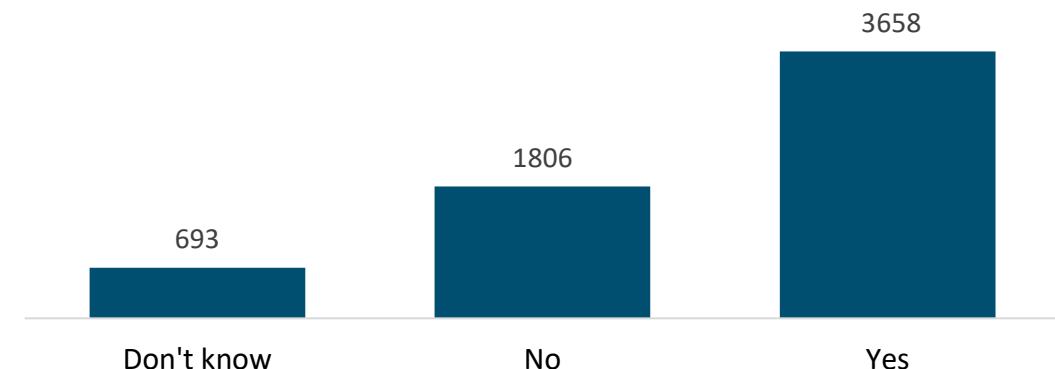
# Pre-congress survey

# A:care pre-congress survey – 6157 participants

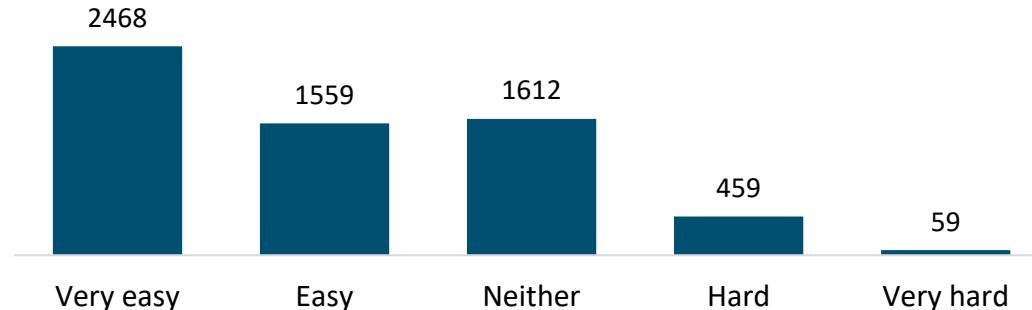
## 1. HOW GOOD IS YOUR UNDERSTANDING OF THE REASONS WHY PATIENTS ARE SOMETIMES NON-ADHERENT TO THEIR MEDICATION??



## 3. HAVE YOU EVER USED BEHAVIOR CHANGE TECHNIQUES WITH YOUR PATIENTS BEFORE TO IMPROVE THEIR ADHERENCE TO MEDICATION?



## 2. THINKING ABOUT YOUR PATIENTS, HOW EASY OR DIFFICULT DO YOU FIND ASSESSING THEIR RISK OF NON-ADHERENCE?



## 4. HAVE YOU EVER USED TOOLS WITH YOUR PATIENTS TO MEASURE AND AID THEIR ADHERENCE TO MEDICATION (E.G. QUESTIONNAIRES)?

