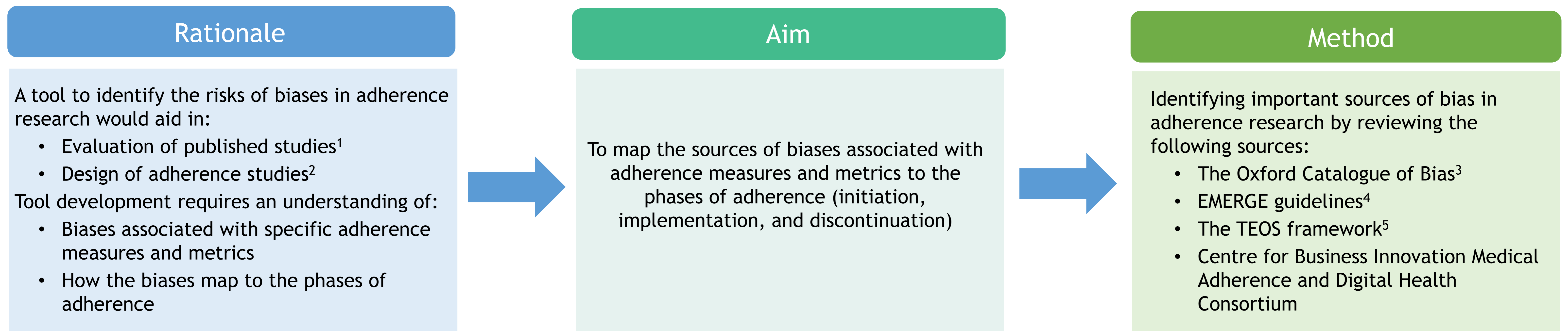


Understanding sources of bias in medication adherence research

Sinnappah KA¹, Hughes DA², Stocker SL³, Vrijens B⁴, Aronson JK⁵, Holland J⁶, Wright DFB¹

¹School of Pharmacy, University of Otago, Dunedin, New Zealand; ²Bangor University, Bangor, Wales; ³School of Pharmacy and Faculty of Medicine and Health, University of Sydney, Sydney, Australia; ⁴AARDEX Group and Liège University; ⁵Centre for Evidence Based Medicine, Nuffield Department of Primary Care Health Sciences, University of Oxford, UK; ⁶Centre for Business Innovation Medical Adherence and Digital Health consortium



Preliminary results

	Patient self-reporting	Patient questionnaire	Pill counts	Prescription and claims databases	Electronically monitored therapy	Observed therapy	Monitoring drug concentrations or biomarkers
Initiation	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Information Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Information Insensitive measure Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Insensitive measure Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Information Insensitive measure 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Insensitive measure Unacceptability
Implementation	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Hawthorne effect Information Non-response Recall Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Information Insensitive measure Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Hawthorne effect Insensitive measure Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Availability Information Insensitive measure 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Hawthorne effect Novelty Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Hawthorne effect Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Hawthorne effect Unacceptability
Discontinuation	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Information Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Information Insensitive measure Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Availability Insensitive measure Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Availability Information Insensitive measure 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Unacceptability 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Insensitive measure Unacceptability

Figure 1. Mapping of biases for adherence measures to the phases of adherence (initiation, implementation, and discontinuation)^{3,6}.

	Percent of medication taken	Questionnaire score	Proportion of days covered (PDC)	Medication possession ratio (MPR)	Medication-taking events summary	Daily medication record	Plasma concentrations or biomarkers
Initiation	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Information Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information Insensitive measure Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information Insensitive measure Reporting 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information Insensitive measure Reporting 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Information 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Insensitive measure
Implementation	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Hawthorne effect Information Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information Insensitive measure Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information Insensitive measure Reporting 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information Insensitive measure Reporting 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Hawthorne effect Information 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Hawthorne effect Insensitive measure
Discontinuation	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Information Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information Insensitive measure Non-response Recall 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information Insensitive measure Reporting 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information Insensitive measure Reporting 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Information 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Information 	<p><i>Biases</i></p> <ul style="list-style-type: none"> Apprehension Insensitive measure

Figure 2. Mapping of biases for adherence metrics to the phases of adherence (initiation, implementation, and discontinuation)^{3,6}.

Conclusions

- Based on preliminary findings, the following ten types of biases are likely to affect adherence at different adherence phases: apprehension bias (desirability bias), availability bias, the Hawthorne effect, novelty bias, information bias, insensitive measure bias, non-response bias, reporting bias, recall bias and unacceptability bias
- Most of these biases are described in the Catalogue of Bias³
- Understanding them is critical for the development of a risk of bias tool for adherence research

1. Sinnappah et al. *Int J Pharm Pract.* 2022; 30: 215-25.

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3. Centre for Evidence Based Medicine. *Catalogue of Bias.* <https://catalogofbias.org>.

4. De Geest et al. *Ann Intern Med.* 2018; 169: 30-5.

5. Dima et al. *Br J Clin Pharmacol.* 2021; 87: 2521-33.

6. Vrijens et al. *Br J Clin Pharmacol.* 2012; 73: 691-705.