

ESPACOMP

Workshop 1: Adherence Data Analysis

Faculty:

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[Dr. Samuel Allemann](#), PhD, RPh, Clinical Pharmacist (University of Basel, Switzerland) and Medication adherence expert (Swiss Pharmacists' Association, Switzerland)

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[Prof. Dr. Bernard Vrijens](#), PhD, Invited professor of Biostatistics (Liège University, Belgium) & CEO, Scientific Lead (AARDEX Group, Belgium)

[Prof. Dr. Ira Wilson](#), PhD, MD, MSc, FACP, Professor and Chair of Health Services, Policy and Practice, Professor of Medicine (Brown University, USA)

Introduction:

The 2019 ESPACOMP annual meeting in Porto will be preceded by a 3-day workshop on Adherence Data Analysis, on 19-21 November. This workshop expands on previous ESPACOMP training in order to provide more practical tools for researchers to learn and perform analyses of adherence data in a supportive environment and interactive manner. Adherence to medications is usually estimated based on three data sources: electronic monitoring (EM), electronic healthcare databases (prescription, dispensing or claims data; EHD), or self-report (SR). There are numerous options available for data processing, which make it difficult for individual researchers to select the most appropriate options for their research question and study context. Moreover, although generic methods of data processing can be adapted to adherence analyses, there are numerous specificities, which researchers need to take into account. This 3-day workshop aims to provide the theoretical structure and practical tools for researchers to design adherence studies and perform analysis of adherence data in a transparent and reproducible manner. Data analysis will be performed using the statistical programming language R, and the programme will cover R basics, adherence concepts, research design issues, hands-on demonstrations, and group and individual practice sessions on these three data sources. Participants will be able to use the example datasets and code provided, and also to adapt code for their own datasets and research needs. The workshop will be facilitated by Samuel Allemann (Switzerland), Alexandra Dima (France), Isabella Locatelli (Switzerland), Marie Schneider (Switzerland), Bernard Vrijens (Belgium) and Ira Wilson (USA).

This workshop is intended for researchers and advanced students interested to estimate adherence from electronic monitoring, electronic healthcare databases or self-report data. R experience is not required, basic training will be provided; likewise, we will provide a quick up-to-date overview of adherence concepts and measurement tools.

Learning objectives:

By the end of the workshop, participants will be able to:

- (1) perform basic data analysis and plotting in R
- (2) describe the process of adherence to medications and its components, and how they apply to different research questions and study designs
- (3) explain the different measurement options available from EM, EHD and SR
- (4) calculate adherence to medications from SR, EM and EHD using/adapting prepared step-by-step R scripts on sample datasets.

Learning methods:

Interactive presentations; hands-on demonstrations (datasets provided); discussion; small group and individual work. Throughout the workshop, participants will be required to use the datasets and code provided to run the analyses presented on their own computers and interpret the output. They will be invited to examine the R code and identify

elements that could be adapted for similar analyses in other datasets (existing or hypothetical). Optionally, they could work on their own datasets and develop an R-based analysis script based on the code provided.

Bibliography:

A reading list will be sent to participants approximately one month prior to the meeting.

Maximum number of participants: 30

Requirements for participation:

To help preparing the workshop content and targeting their needs, participants will be asked to provide information on prior training and work experience in statistics, their level of familiarity with R & R Studio, their current/ recent/ future work with adherence data, their interest to work with their own dataset in the practice session, and their expectations from the workshop.

They will be given the option to describe an example of study (at any stage) & related questions for group work. They could also prepare a dataset from their own research to analyze during the workshop.

Before the workshop, participants will be asked to download R and R Studio on their personal laptops and familiarize themselves with the interface and basic options

**All participants need to print out the materials themselves.
Hard copies will not be provided at the conference!**

AGENDA

Day 1

08:45-09:00	Welcome and Review of the Workshop Program	Alex Dima
	General overview and welcome	
09:00-10:45	R and R Studio refresher/introduction (optional)	Alex Dima, Sam Allemann
	Basics of working with R and open science workflows; working with R operations, functions and scripts.	
10:45-11:00	BREAK	
11:00-12:00	Introduction to adherence measurement	Bernard Vrijens, Ira Wilson
	Review of adherence definitions and guidelines: ABC taxonomy; EMERGE guidelines; adherence events, periods, timelines; research designs; data sources; context factors.	
12:00-12:45	Discussion on applying ABC and EMERGE guidelines	All
	Group discussion of examples of medication event histories and different data sources.	
12:45-13:45	LUNCH	
13:45-15:15	Choice of adherence measures (1)	Small group work
	Practical exercise on choice of measurement tools and reporting – study examples	
15:15-15:30	BREAK	
15:30-17:00	Choice of adherence measures (2)	Small group work
	Practical exercise on choice of measurement tools and reporting – study examples	
17:00-17:30	Q&A on adherence measurement	All
	Group discussion on conceptual bases of adherence measurement and their practical applications	

Day 2

08:45-09:00	Welcome and Review of the Day Program	Alex Dima
	General overview and welcome	
09:00-10:00	Introduction to SR analysis	Alex Dima, Ira Wilson, Marie Schneider
	Overview of SR tools in adherence measurement; principles of psychometrics, questionnaire development, choice and validation of tools.	
10:00-10:45	How to ask patients about their medication adherence?	Small group work
	Practical exercise on question wording and strategies to improve data quality	
10:45-11:00	BREAK	
11:00-12:00	Demo R analysis SR tool	Alex Dima
	Presentation of an R script for analyzing an example adherence SR tool; dataset provided.	
12:00-12:45	Run analysis on the SR dataset provided	Small group work
	Participants will re-run the analysis demonstrated on their own computers and interpret & experiment with the script provided.	
12:45-13:45	LUNCH	

13:45-14:45	Introduction to EM data analysis	Isabella Locatelli, Bernard Vrijens
	Review of data characteristics and methods appropriate to EM data; visualization, summary statistics, longitudinal approach, time series of binary data.	
14:45-15:15	EM data preparation	Marie Schneider
	Review of steps necessary for preparing EM data for analysis – data preparation checklist and range of choices available	
15:15-15:30	BREAK	
15:30-16:45	Statistical elements and demo R analysis EM data	Isabella Locatelli
	Presentation of statistical bases and R script for analyzing an example EM dataset.	
16:45-17:30	Run analysis on the EM dataset provided	Small group work
	Participants will re-run the analysis demonstrated on their own computers and interpret & experiment with the script provided.	

Day 3

08:45-09:00	Welcome and Review of the Day Program	Alex Dima
	General overview and welcome.	
09:00-10:15	Introduction to EHD data analysis	Sam Allemann, Alex Dima
	Review of data characteristics and methods appropriate to EHD data; types of EHD datasets; AdhereR functions for initiation, implementation and persistence; summaries vs trajectories.	
10:15-10:45	EHD data preparation	Sam Allemann
	Review of steps necessary for preparing EHD data for analysis – data preparation checklist and range of choices available; using multiple datasets (prescription, dispensing, hospitalisations)	
10:45-11:00	BREAK	
11:00-12:00	Demo R analysis EHD data	Sam Allemann
	Presentation of an R script for analyzing an example EHD dataset.	
12:00-12:45	Run analysis on the EHD dataset provided	Small group work
	Participants will re-run the analysis demonstrated on their own computers and interpret & experiment with the script provided.	
12:45-13:45	LUNCH	
13:45-15:15	Practical work on EM/EHD/SR data (1)	Small group work
	Participants will choose a type of data to focus on for the afternoon and a personal objective (in-depth study of the code and dataset provided; adapting code to their own dataset) and work in small groups with similar objectives.	
15:15-15:30	BREAK	
15:30-16:45	Practical work on EM/EHD/SR data (2)	Small group work
	Participants will continue work on their personal objectives; problem solving and general help by workshop facilitators.	
16:45-17:15	Discussion and Evaluation of Workshop & Conclusion	All
	Review current workshop and discuss improvements in future workshops.	