**Best approaches to move between SAS & R article**

 The first major hurdles to cross when transitioning to a multilingual environment is to move the data from one language to another. On the face of it, the easiest way to do this is through language agnostic formats like CSV’s. But these file types lose all formatting, such as dates become character values (or even worse numeric values[[1]](#footnote-1)), making the use of these file types prone to risk. While the ‘best’ way to move data between languages is a centralized data storage mechanism such as a relational database. Those solution require lots of overhead. This article will cover alternative file types and what is needed to move from one system to another.

 To go from SAS to R data can be written out to either a SAS7BDAT, which is the easiest format to write out to from SAS, or a SAS transport file (xpt). Using either file type will preserve dates and labels. All you need to do is use the {haven} package and read the file using `read\_sas()` or `read\_xpt()`.

This isn’t a complete magic bullet though. Unlike SAS, R doesn’t have a concept of formats associated with data. Values are either character, numeric, logical, factor, or date. This means when doing any sort of data manipulation values should be kept as dates, but when displayed, dates may need to be converted to character to achieve a specific formatting.

 The easiest way to go from R to SAS is with a SAS transport file (xpt). SAS7BDAT is a proprietary file format, which makes it difficult for open-source software to emulate. Although {haven} can technically create a SAS7BDAT, SAS cannot read the file; it can only be read back into R. SAS transport files on the other hand are an open standard, so functions have been created in R to write them. The easiest way to do this is with the {haven} function `write\_xpt()`. By default `write\_xpt()` will create a version 5 SAS transport file, which is what is required by CDISC. The only downside is that {haven} doesn’t provide all the information to the xpt file needed to pass a Pinnacle 21 check.

To get that level of information you currently need to use the {xportr} package. While not yet on CRAN, this package is part of the pharmaverse collaboration and can add the attributes expected in SAS such as length and formats. While still in an experimental phase, it should be available on CRAN soon and will hopefully fill some of the gaps that currently exist.

For ease of use across all platforms we recommend SAS transport files (xpt’s) as they can easily be written to with both SAS and R while preserving types and labels. Because it is an open format it easily fits into the world of open source, while still having a close connection to SAS. For example code of how to write out to transport files see [this](https://www.pharmasug.org/proceedings/2021/EP/PharmaSUG-2021-EP-057.pdf) paper by Todd Case and YuTing Tian from PharmaSUG 2021.

1. Dates in SAS vs R have different origins. In SAS all dates are the number of days since 1st Jan 1960 where in R dates are the number of days since 1st Jan 1970. [↑](#footnote-ref-1)