



Sweave or how to make 286 reports in two clicks

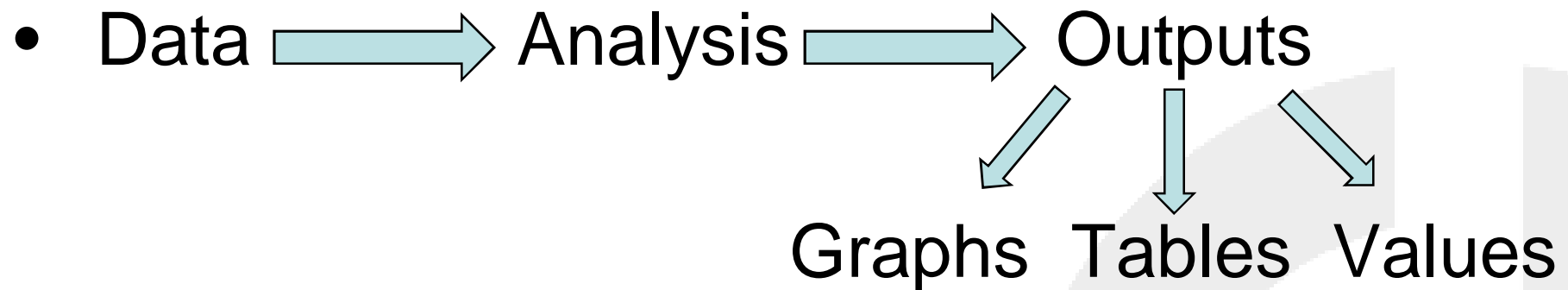
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Genexion SA

useR! 2008

Reporting: the classical way

- Statisticians usually make statistics and then make a report



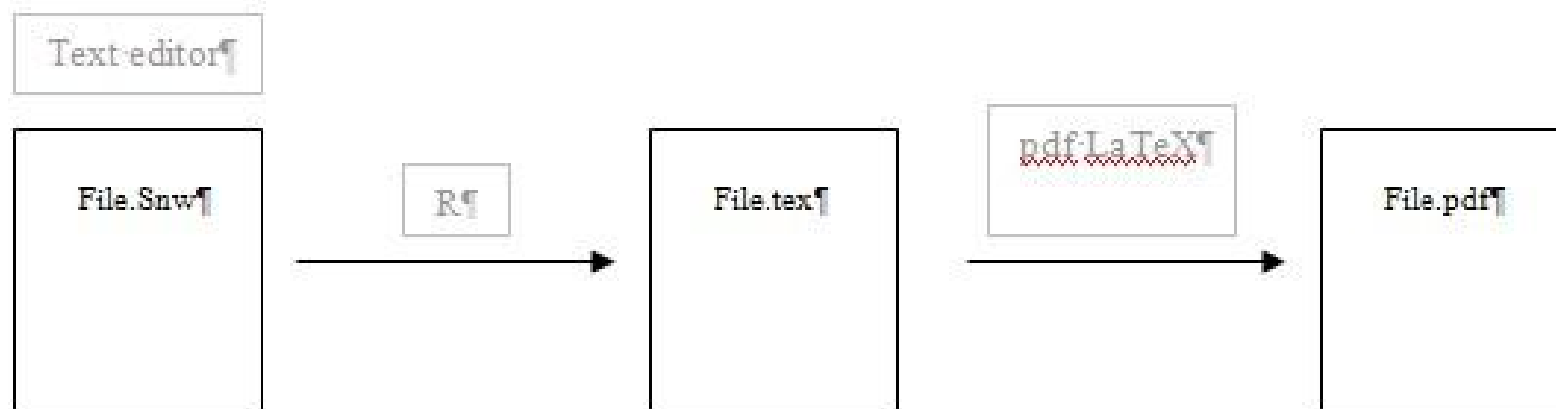
- Report:
 - insertion of text (Introduction, results, conclusion)
 - copy and paste outputs

Reporting: the classical way

- If data change, you have to restart from beginning.
- To make the same report with the different data, you have to do the same thing twice and adapt you text.
- If you want to insert your commmands, you have to copy, paste and format.
- To insert values in the text, copy, paste and format or rewrite without any mistake.

Sweave: Presentation

- Sweave was created by Friedrich Leisch.
- Uses R and LaTeX.
- Insertion of R code in LaTeX file to generate a report at the same time the data are analysed.



Sweave: Advantages

- If your data are updated, the analyses are reruned and report is updated at the same time.
- To do the same report with other data, just change the input and rerun. The report is updated.
- You can insert or not the commands used in the analyses.
- Values calculated by R can be automatically inserted in the text.

Sweave: Example 1

```
\documentclass[a4paper]{article}
\usepackage{C:/texmf/tex/latex/setspace/setspace}
\usepackage[pdftex]{geometry}
\geometry{vmargin=2.25cm, hmargin=2cm}
\usepackage[french]{babel}
\usepackage[latin1]{inputenc}
\usepackage[T1]{fontenc}
\usepackage{float}
\usepackage{fancyvrb}
\usepackage{C:/texmf/tex/latex/fancyhdr/fancyhdr}
\usepackage{C:/texmf/tex/latex/arial/arial}
\usepackage{graphics}
\usepackage{longtable}
\renewcommandfamilydefault{\sfdefault}
\pagestyle{fancy} %to display headers and footers.
\usepackage{color}
\setlength{\parindent}{0pt}
\setlength{\parindent}{0pt}
\setlength{\abovecaptionskip}{5pt} %space btw table and label
\setlength{\belowcaptionskip}{0pt} %space after table label
\SweaveOpts{echo=false}
```

Sweave: Example 1

```
\begin{document}

<<DATA IMPORT, results=hide>>=
rm(list=ls())
library("xlsReadWrite")
library("xtable")
data<-read.xls("patients tab.xls")
rep<-read.xls("representants par région.xls")
...
@

\section{Introduction}
This is a classical report. You can write text like you would do in any report.

\section{Dose Titration}

<<TABLE, results=tex>>=
...
tab12.3<-table(data$d11, data$regions)
xtable(tab12.3, caption="Results for the total population", align="ll")
@
```

Sweave: Example 1

```
<<GRAPH, fig=true, width = 12>>=
```

```
barplot(tab12.3pourt[1,], ylim=c(0,110), xlim=c(0,3), names.arg=c("On going","Finished", "Na" ), space=c(0,0,0.1),  
        col="beige", main="Romandy", cex.main=1.1)
```

```
text(x=c(0.5,0.5+1,0.5+2.1), y=c(tab12.3pourt[1,1]+5, tab12.3pourt[2,1]+5, tab12.3pourt[3,1]+5),  
     labels=paste(c(tab12.3pourt[1,1], tab12.3pourt[2,1], tab12.3pourt[3,1]), rep("%",3)))
```

```
@
```

```
\section{Conclusion}
```

In the text, you can insert results which are updated with data.

These results show that $\text{\Sexpr{tab12.3pourt[1,1]}}$ % of the subjects are on going.

```
\end{document}
```


Sweave: Customized reports

- Instead of making the same report with different data, make the same report with different subsets of a dataset.
- Automate the iteration
- Insert variables for each element of the report which has to be customized.

Sweave: Example 2

```
\documentclass[a4paper]{article}
\usepackage{C:/texmf/tex/latex/setspace/setspace}
\usepackage[pdftex]{geometry}
\geometry{vmargin=2.25cm, hmargin=2cm}
\usepackage[french]{babel}
\usepackage[latin1]{inputenc}
\usepackage[T1]{fontenc}
\usepackage{float}
\usepackage{fancyvrb}
\usepackage{C:/texmf/tex/latex/fancyhdr/fancyhdr}
\usepackage{C:/texmf/tex/latex/arial/arial}
\usepackage{graphics}
\usepackage{longtable}
\renewcommand{familydefault}{\sfdefault}
\pagestyle{fancy} %to display headers and footers.
\usepackage{color}
\setlength{\parindent}{0pt}
\setlength{\parindent}{0pt}
\setlength{\abovecaptionskip}{5pt} %space btw table and label
\setlength{\belowcaptionskip}{0pt} %space after table label
\SweaveOpts{echo=false}
```

Sweave: Example 2

- Master file

```
\begin{document}
```

```
<<DATA IMPORT, results=hide>>=
```

```
#Here is the general code, not specific to a doctor, which is executed only once
```

```
rm(list=ls())
```

```
library("xlsReadWrite")
```

```
library("xtable")
```

```
k<-0
```

```
data<-read.xls("patients tab.xls")
```

```
rep<-read.xls("representants par région.xls")
```

```
med<-read.xls("Copy of medecins F.xls")
```

```
levels(med$nom)<-med$nom
```

```
#list of doctor names
```

```
data$num_contrat<-substr(data$med, 5,7)
```

```
ind<-match(data$num_contrat, contrats$num_contrat)
```

```
data$nom_med<-contrats$med_contrat[ind]
```

```
nom.medecins<-unique(data$nom_med)
```

```
@
```

Sweave: Example 2

```
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}  
\SweaveInput{Example2Scriptfile.rnw}
```

```
\end{document}
```

Sweave: Example 2

- Script file:

```
\setcounter{section}{0}  
\setcounter{table}{0}  
\setcounter{figure}{0}  
\pagenumbering{arabic}
```

```
<<SUBDATA, results=hide>>=  
k<-k+1
```

```
#code(s) for a specified doctor  
code.sub<-med$num_contrat[k]
```

```
#doctor name  
nom.medecin<-nom.medecins[k]  
data.sub<-data[data$num_contrat==code.sub,]
```

```
#number of patient for a specified doctor  
nbpat<-dim(data.sub)[1]  
n<-nbpat
```

```
@
```

Sweave: Example 2

```
\section{Introduction}
```

This is a classical report. You can write text like you would do in any report.

This report concerns `\Sexpr{nom.medecin}`.

```
\section{Dose Titration}
```

```
<<TABLE, results=tex>>=
```

```
...
```

```
tab12.3<-table(data.sub$d11, data$regions)
```

```
xtable(tab12.3, caption="Results for the total population", align="l")
```

```
@
```

```
<<GRAPH, fig=true, width = 12>>=
```

```
barplot(tab12.3pourt[,1], ylim=c(0,110), xlim=c(0,3), names.arg=c("On going","Finished", "Na" ), space=c(0,0,0.1),  
col="beige", main=nom.medecin, cex.main=1.1)
```

```
text(x=c(0.5,0.5+1,0.5+2.1), y=c(tab12.3pourt[1,1]+5, tab12.3pourt[2,1]+5, tab12.3pourt[3,1]+5),  
labels=paste(c(tab12.3pourt[1,1], tab12.3pourt[2,1], tab12.3pourt[3,1]), rep("%",3)))
```

```
savePlot(filename=paste("GraphDoctor",k,".pdf", sep=""), type="pdf")
```

```
@
```

```
\begin {figure}[H]
```

```
\centering
```

```
\includegraphics{\Sexpr{paste("GraphDoctor",k,".pdf", sep=")}}
```

```
\end{figure}
```

Sweave: Example 2

```
\section{Conclusion}
```

In the text, you can insert results which are updated with data.

These results show that `\Sexpr{tab12.3pourec[1,1]}` % of the subjects are on going.

```
\newpage
```

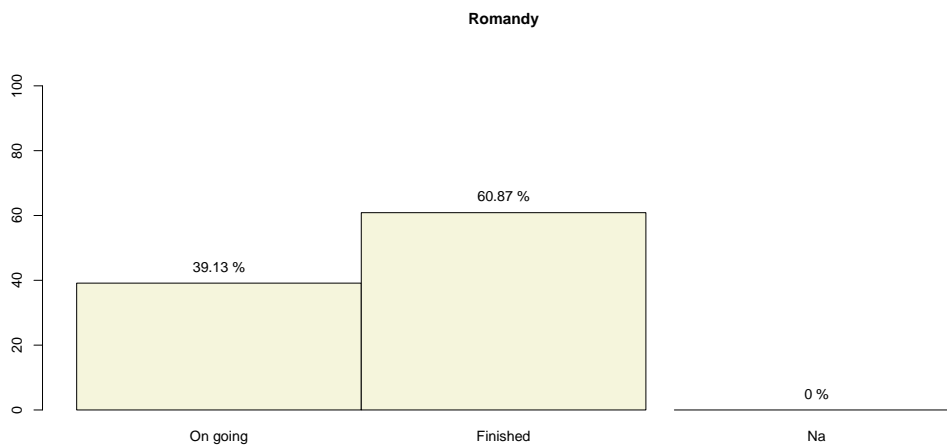
1 Introduction

This is a classical report. You can write text like you would do in any report.

2 Dose Titration

	Romandy
On going	18 (39.13%)
Finished	28 (60.87%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 39.13% of the subjects are on going.

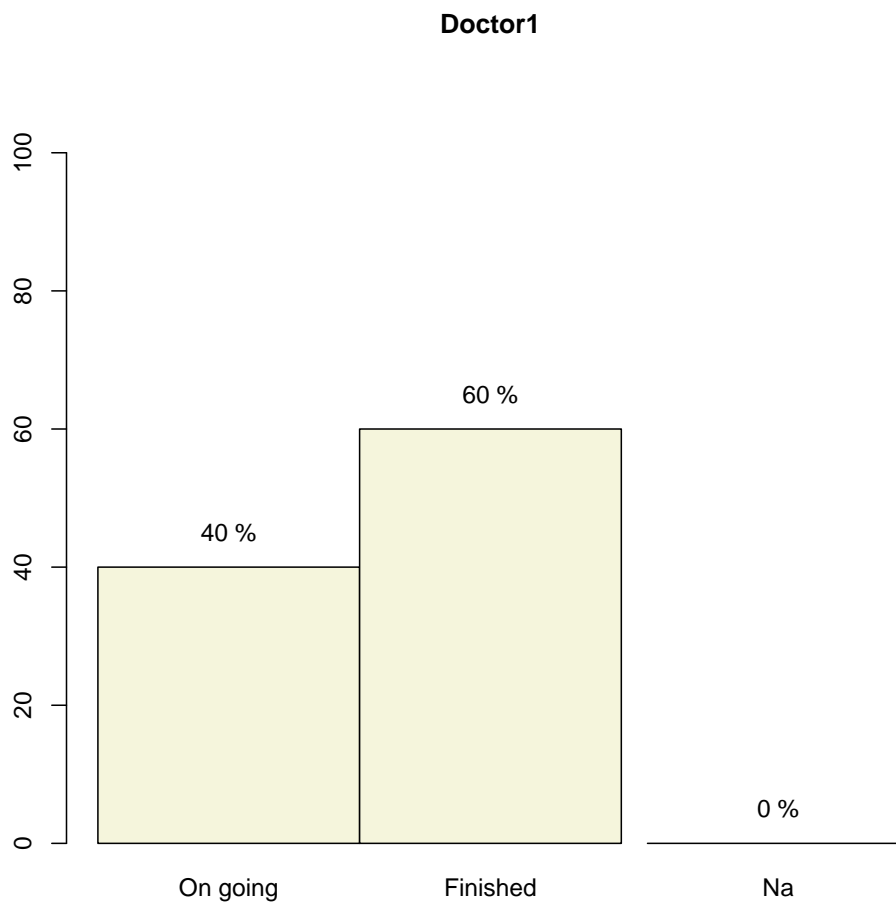
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor1.

2 Dose Titration

	Doctor1
On going	2 (40%)
Finished	3 (60%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 40% of the subjects are on going.

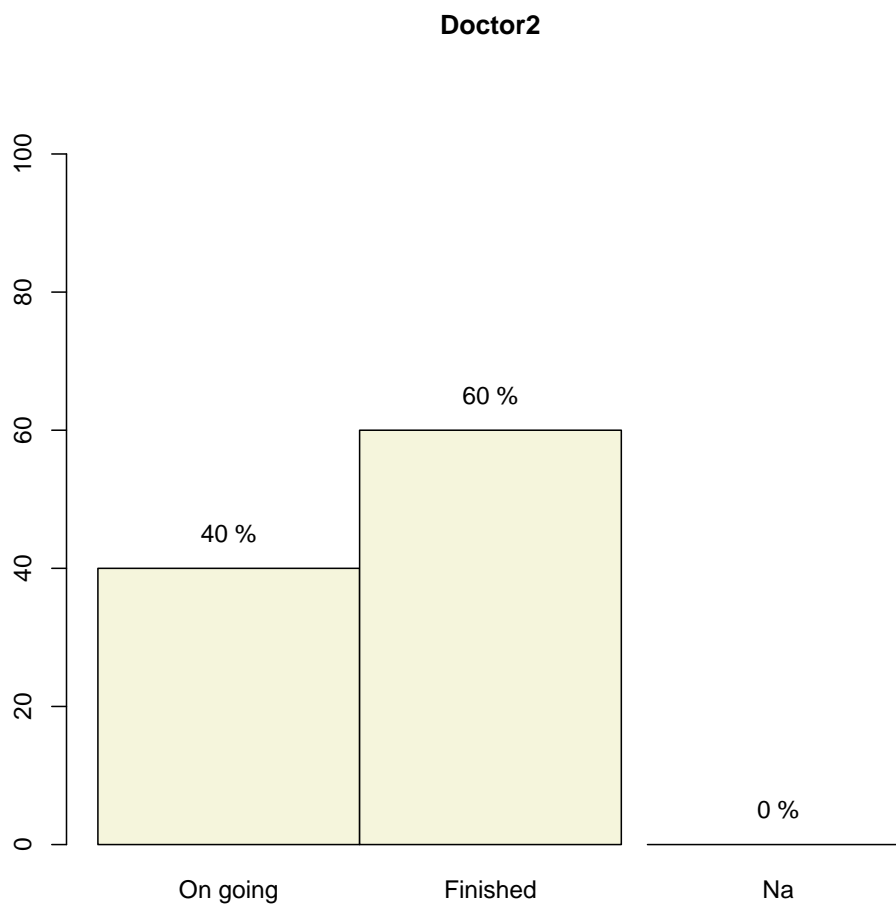
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor2.

2 Dose Titration

	Doctor2
On going	2 (40%)
Finished	3 (60%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 40% of the subjects are on going.

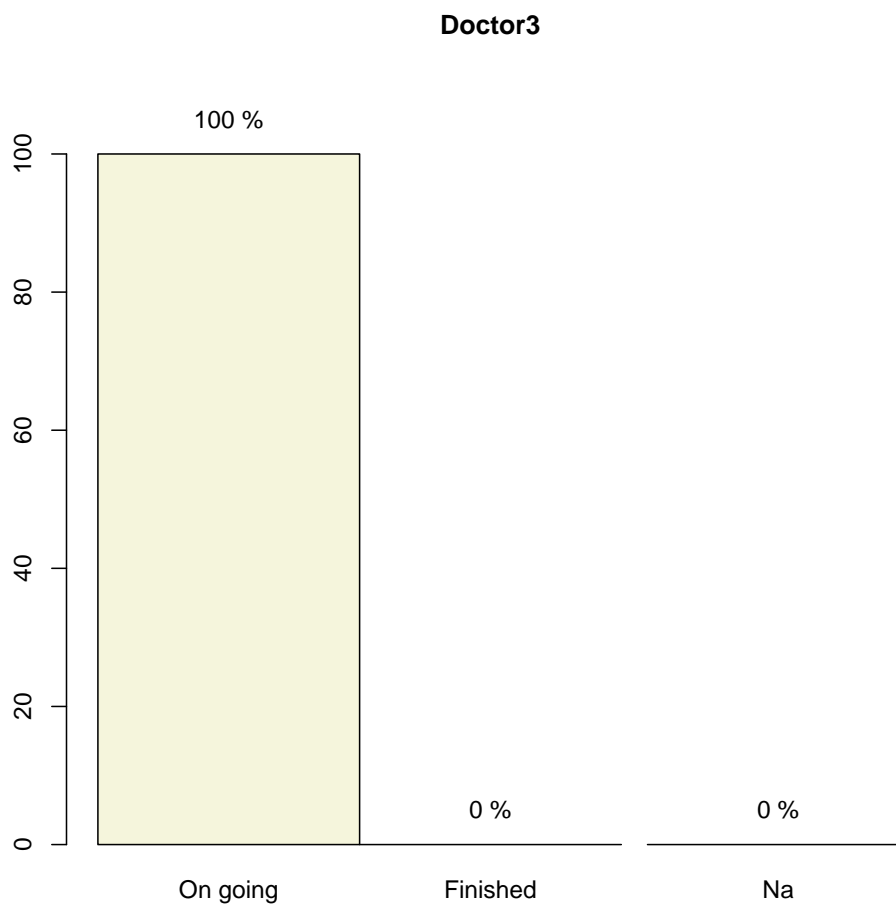
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor3.

2 Dose Titration

Doctor3	
On going	1 (100%)
Finished	0 (0%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 100% of the subjects are on going.

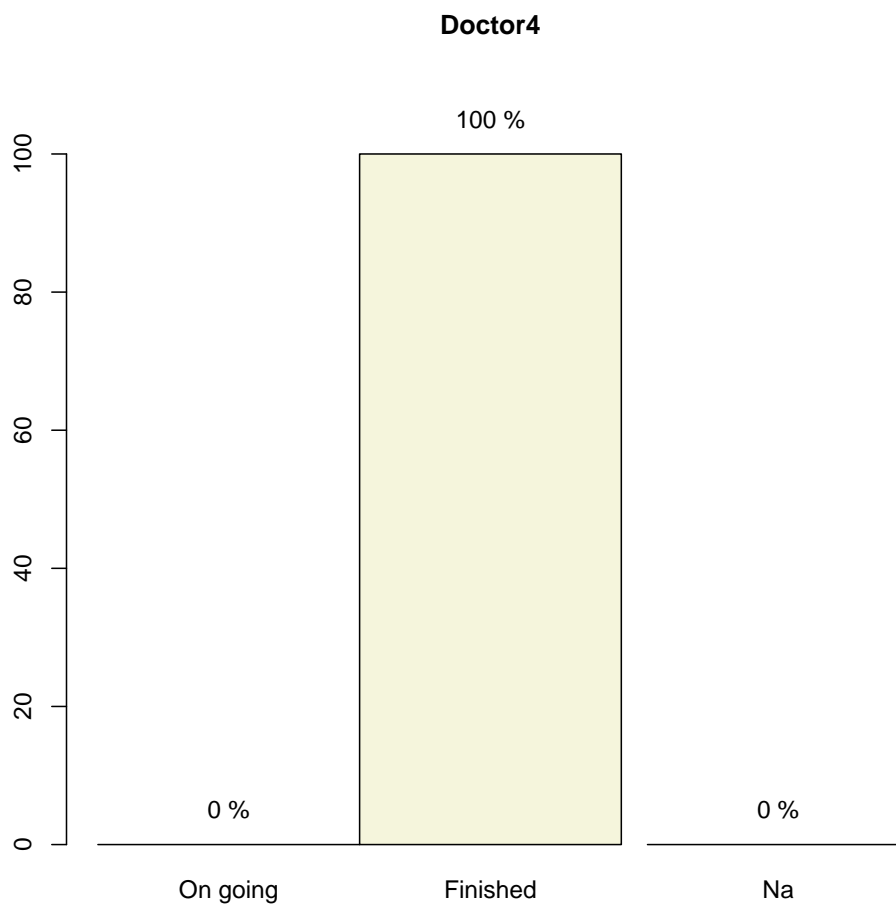
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor4.

2 Dose Titration

Doctor4	
On going	0 (0%)
Finished	5 (100%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 0% of the subjects are on going.

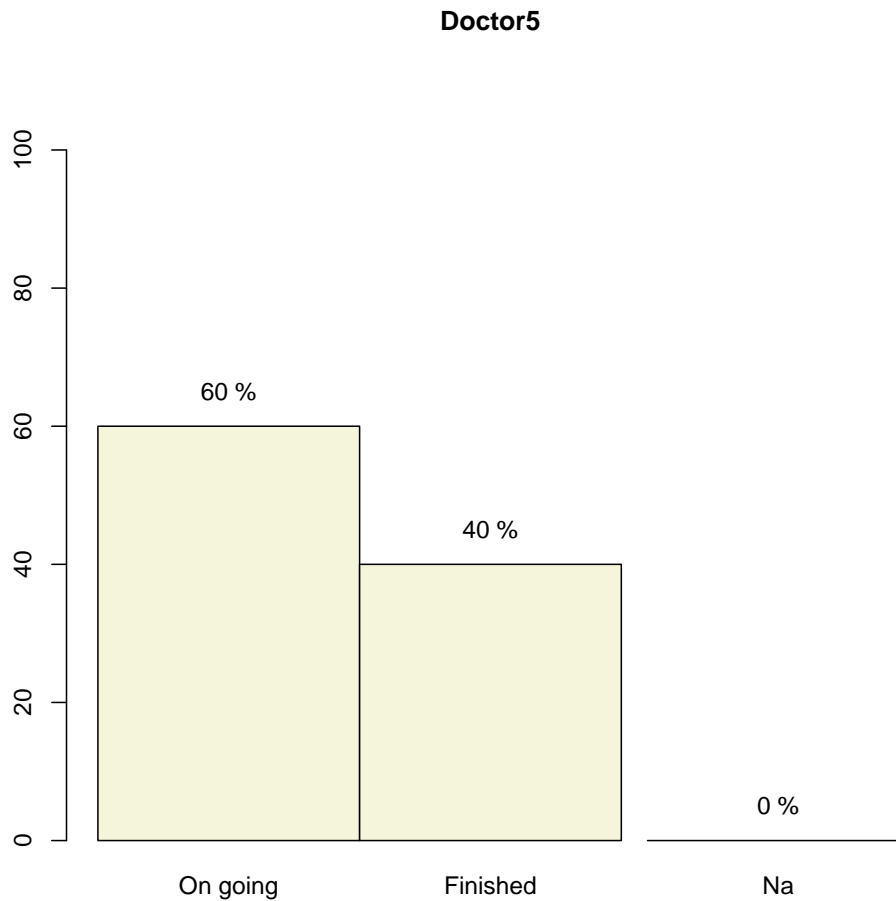
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor5.

2 Dose Titration

	Doctor5
On going	3 (60%)
Finished	2 (40%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 60% of the subjects are on going.

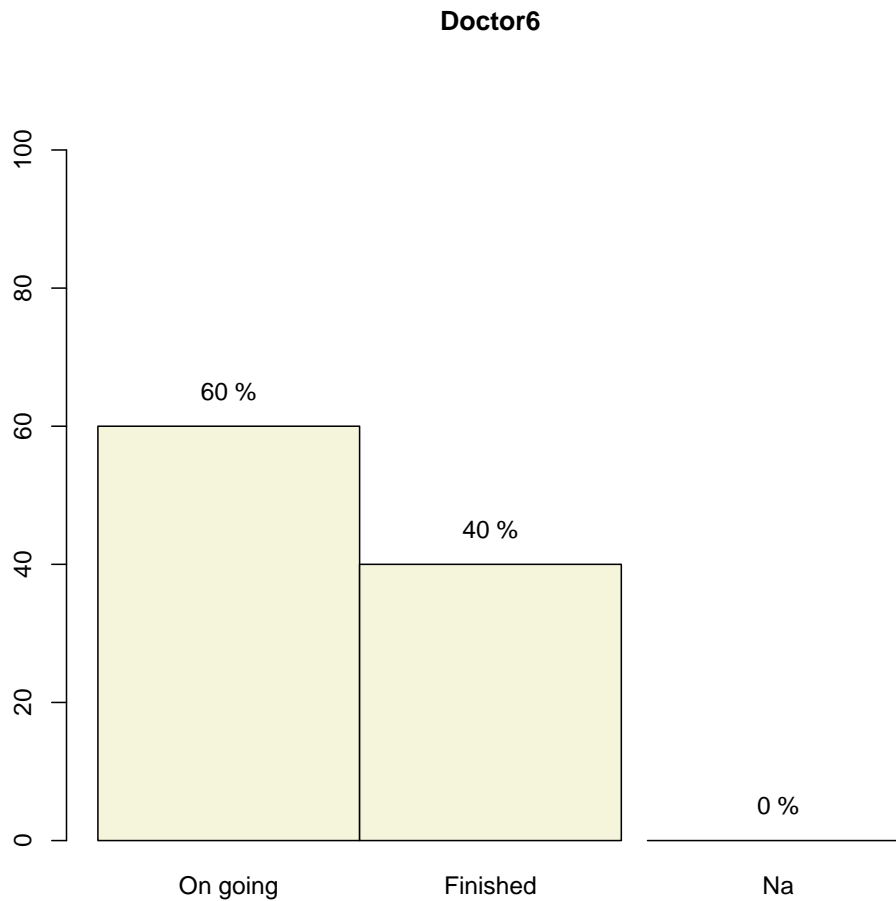
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor6.

2 Dose Titration

	Doctor6
On going	3 (60%)
Finished	2 (40%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 60% of the subjects are on going.

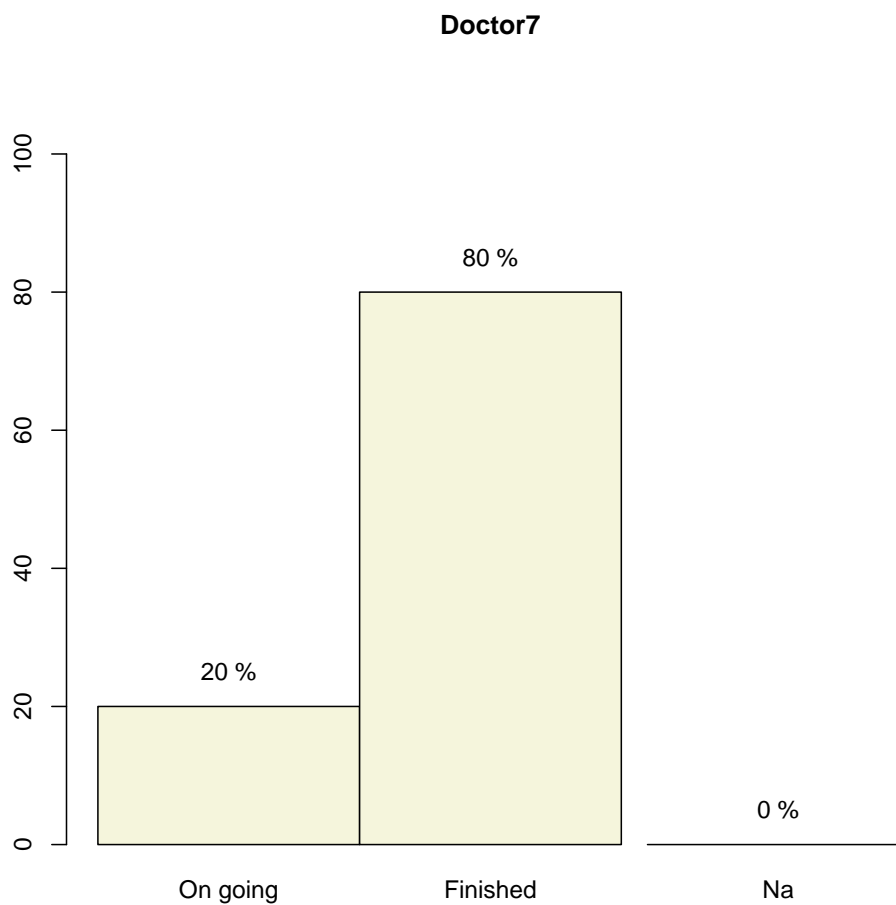
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor7.

2 Dose Titration

	Doctor7
On going	1 (20%)
Finished	4 (80%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 20% of the subjects are on going.

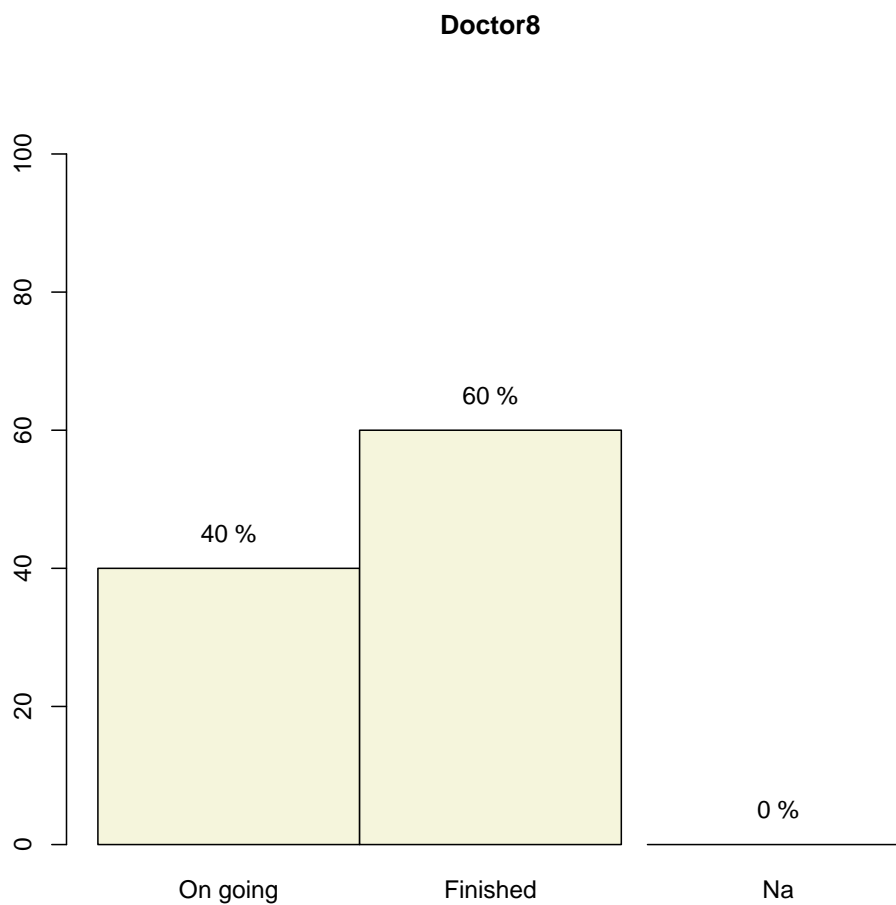
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor8.

2 Dose Titration

	Doctor8
On going	2 (40%)
Finished	3 (60%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 40% of the subjects are on going.

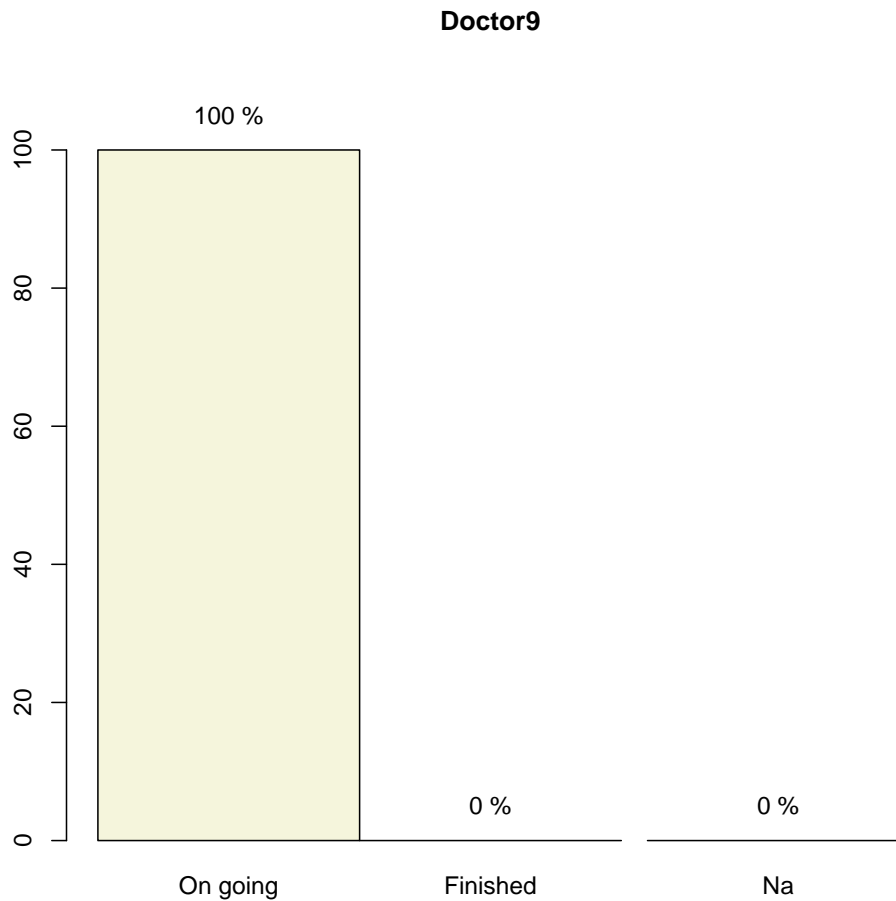
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor9.

2 Dose Titration

	Doctor9
On going	3 (100%)
Finished	0 (0%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 100% of the subjects are on going.

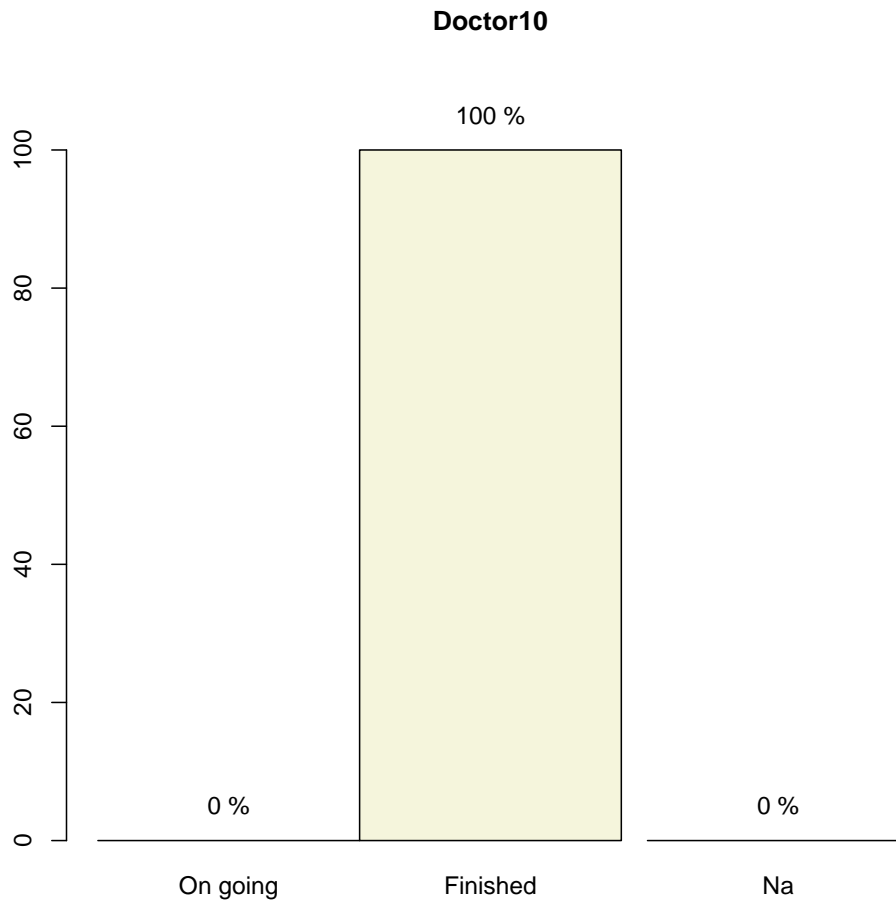
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor10.

2 Dose Titration

	Doctor10
On going	0 (0%)
Finished	2 (100%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 0% of the subjects are on going.

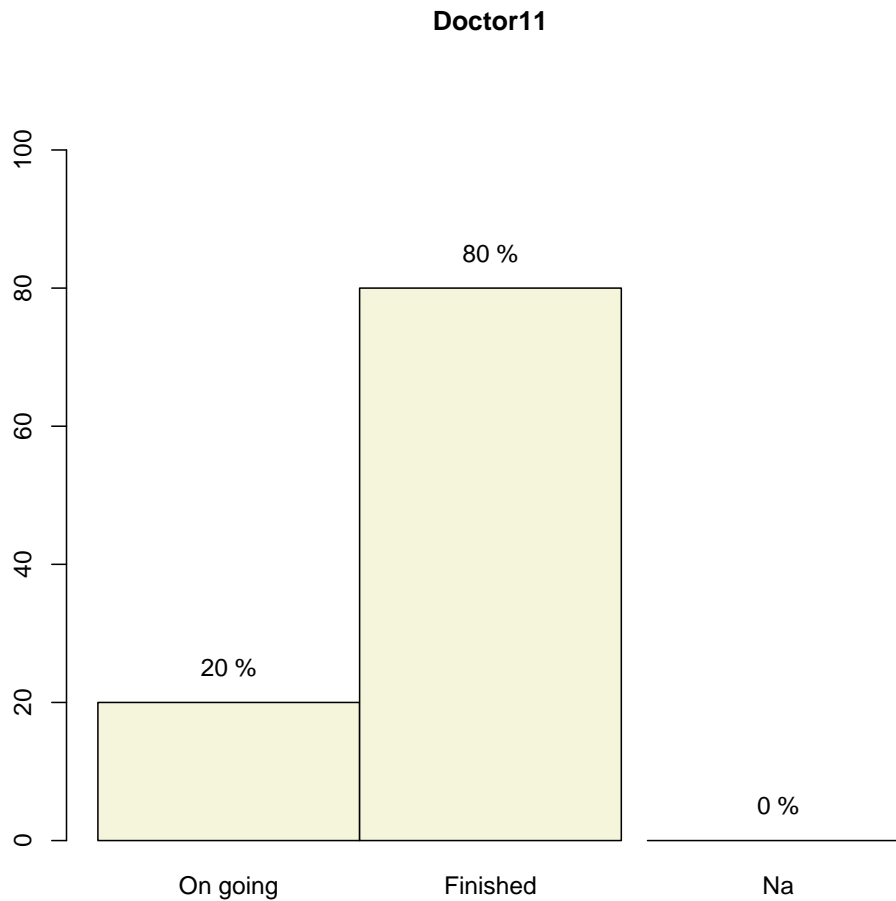
1 Introduction

This is a classical report. You can write text like you would do in any report. This report concerns Doctor11.

2 Dose Titration

Doctor11	
On going	1 (20%)
Finished	4 (80%)
Na	0 (0%)

Tab. 1 – Results for the total population



3 Conclusion

In the text, you can insert results which are updated with data. These results show that 20% of the subjects are on going.