

# Münsingen-Rain necropolis (Bern, Switzerland)

A quantative study of Late Iron Age fibulae

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*In this R Markdown document*

- Follow the comments and delete them once completing the instructions
- For each block of instructions there is an estimation of the average duration in minutes
- Overall duration estimation: 60 min
- Do basic improvements for the layouts (colors, size, etc.), but stay focused on data
- Select a dataset from the `{`archdata`}` package (here: 'Fibulae')
- Read the documentation of the package (``?archdata``) and dataset (``?Fibulae``)
- You will have to update the ``references.bib`` file with your own references

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*YAML header (10 minutes)*

- select your rendering: `**bookdown::pdf_document2:**` or `**bookdown::html_document2:**`
- update the `**title**` depending on the dataset of `{archdata}` you chose
- update the `**author**` name

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# 1 Introduction

```
...
Markdown (10 minutes)
- Write some three lines for Introduction
- present the dataset using Markdown syntax (e.g. italic, bold, lists)
- Import a representative picture image (e.g., map, photograph) depending on your topic
...
```

Munsingen-Rain is a Late Iron Age necropolis composed of *circa* 220 graves, and 300 bronze and iron fibulae. The necropolis became the favored focus for a wide range of experimental investigations, of a typological, chronological, costume historical, art historical and sociological nature (Müller, Jud, and Alt 2008). Here, we will focus on the statistical analysis of fibulae, exploring the archdata R package (Carlson and Roth 2021) (...)

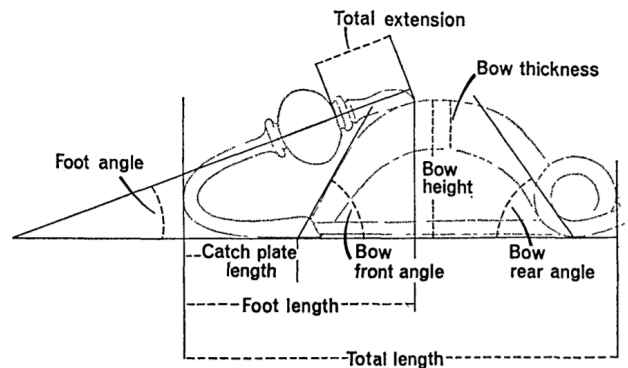


Figure 1: Fibulae measurements (Hodson, 1970)

Hodson (1970) took numerous measurements on the fibulae (Fig. 1). This report aims to realise their statistical analysis (...)

## 2 Dataset description

```
...
Markdown + Descriptive statistics ca (10 minutes)
- Adapt the title
- Compute descriptive statistics (e.g. count of rows, count of columns, means)
- Create descriptive plots (e.g. histograms, boxplots, pie charts, scatterplots)
- Comments the results with Markdown text
- Call variables and figures
...
```

In the studied dataset, there are 30 fibulae described by 14 quantitative variables (FL, BH, BFA, FA, CD, BRA, etc.) (...)

Table 1: Distribution by quantiles of fibulae measurments

	0%	25%	50%	75%	100%
FL	9.0	19.25	21.50	28.750	94.0
BH	7.0	15.00	15.50	18.000	26.0
BFA	1.0	1.00	2.00	4.000	7.0
FA	6.0	8.00	8.00	9.000	10.0
CD	4.0	6.00	7.00	9.000	16.0
BRA	1.0	1.00	2.00	3.750	7.0
ED	2.0	5.00	8.00	9.750	14.0
FEL	0.0	4.00	7.00	11.000	50.0
C	8.0	11.25	15.00	18.000	50.0
BW	2.0	4.00	5.65	8.175	17.6
BT	1.4	3.05	3.85	4.775	7.7
FEW	0.0	1.90	2.50	3.900	8.6
Coils	3.0	4.00	6.00	6.000	22.0
Length	26.0	41.75	49.50	59.750	128.0

The Tab. 1 resumes the distribution of fibulae measurements by quantiles (...)

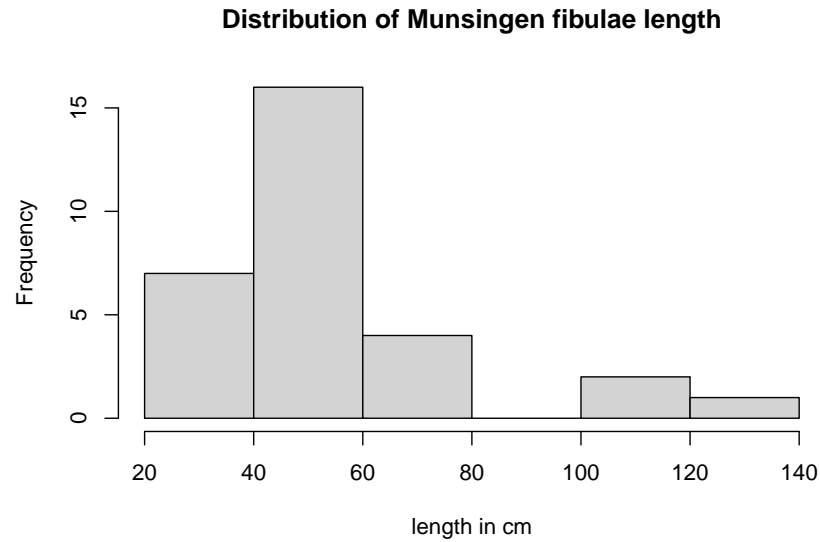


Figure 2: Kernel Density Plot of Length

The histogram of the fibulae length (Fig. 2) shows a ‘L’ shape (...)

### 3 Exploration of the dataset

...

*Markdown + Exploratory statistics ca (10 minutes)*

*- Adapt the title*

```

- Compute exploratory analysis (e.g. factorial analysis, hierarchical clustering)
- Comments the results with Markdown text
- Call variables and figures
...

```

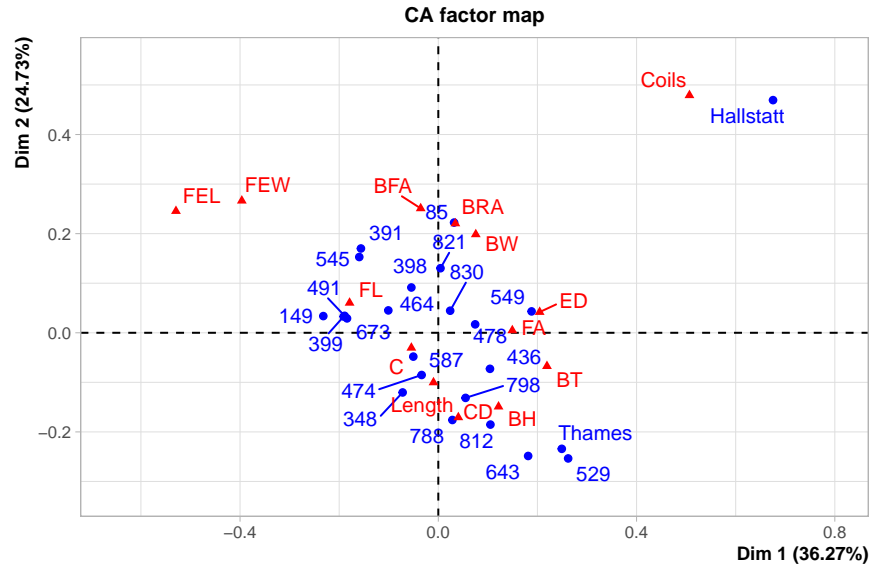


Figure 3: Correspondence Analysis (CA) of the dataset

The Correspondence Analysis (Fig. 3) shows 61 % of the total variance. The point cloud shape is spherical except for one individual (Mno: Hallstatt) and a variable (number of Coils) (...)

## 4 Statistical tests

```

...
Markdown + Confirmatory statistics ca (10 minutes)
- Adapt the title
- Compute confirmatory analysis (i.e statistical tests)
- Comments the results with Markdown text
- Call variables and figures
...

```

Following the Shapiro-Wilk normality test, the distribution of the fibulae length is not normal as the Fig. 2 shown it. It means (...)

## 5 Conclusion

```

...
Markdown + Variable (5 minutes)

```

```
- Write some three lines for Conclusion
- In the YAML header add a new line for an abstract and complete it
...
```

The statistical analysis of the dataset shows (...)

## References

- Carlson, David L., and Georg Roth. 2021. *Archdata: Example Datasets from Archaeological Research*. <https://CRAN.R-project.org/package=archdata>.
- Hodson, Frank Roy. 1970. "Cluster Analysis and Archaeology: Some New Developments and Applications." *World Archaeology* 1 (3): 299–320.
- Müller, Felix, Peter Jud, and Kurt W. Alt. 2008. "Artefacts, Skulls and Written Sources: The Social Ranking of a Celtic Family Buried at Münsingen-Rain." *Antiquity* 82 (316): 462–69. <https://doi.org/10.1017/S0003598X00096940>.