

# Phylogenetic Analysis of Briese Family Relationships - Update

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## Summary

A comparison was made of the STR markers on the Y-chromosome of nine individuals bearing the surname Briese. Based on paper records, two of these individuals were known to be related, but relationships could not be determined for others. The genetic study showed three distinct genetic lineages bearing the Briese surname. Six of the nine were shown to have had a common ancestor within genealogical time, which suggests that a cluster of related Briese families lived in the Deutsch Krone area of West Prussia in the 18<sup>th</sup> century. A seventh individual, originating from a different geographic region, Meseritz in Posen, was more distantly related, while the remaining two individuals were not related at all, either to the group or to each other. While not providing proof, these findings agree with the hypothesis that the Briese surname originated as a “place name” that was initially adopted by unrelated people. This would result in distinct clusters of more-closely related families, genetically distinct from other such clusters. Genetic genealogy can help to determine relationships between emigrant Briese families and those remaining in Germany. More individuals from Briese families with known origins are needed to participate in this study to confirm and enlarge on these preliminary findings.

## Introduction

The Briese surname <sup>1</sup>, as considered here, is of German origin. It is a “place name”, that is when people began adopting surnames in the middle ages, they took the name of the place where they lived. It is also a relatively uncommon surname, with a frequency of 30 per million in Germany and less in parts of the world to where Briese have emigrated <sup>2</sup>. More detail of the origins of the name can be found elsewhere <sup>1</sup>. The distribution of the Briese surname during the 17<sup>th</sup> to 19<sup>th</sup> centuries is shown in Fig. 1. It indicates that the Briese heartland lies in the former Prussian provinces of Brandenburg, West Prussia and Posen, with a pocket occurring in East Prussia and a scattering in the west of Germany. This heartland area has many towns and villages bearing the name Briese, Briesen, or variants of this, and one or more of these are likely sources of the surname.

Being a “place name” suggests multiple origins, where unrelated people would have initially adopted the name Briese, although a single-source origin cannot be ruled out. In both cases, this would lead to clusters of related family groups, as families grew and moved. Classical genealogical research indicates that such geographic Briese clusters existed in the late 18<sup>th</sup> and 19<sup>th</sup> centuries in Brandenburg, West Prussia, East Prussia, Pomerania and Posen <sup>3,4,5</sup> (see Table 1). However, subsequent

internal movement, emigration overseas and displacement due to war has destroyed much of this demographic pattern. If the surname has multiple origins, some of these clusters should be differentiated from other such clusters, a possibility that is testable by genetic comparisons.

During the 19<sup>th</sup> century, a number of Briese families emigrated from these areas to North America, Australia and Brazil <sup>6</sup>. Many of the descendants of these families are now interested in discovering their family roots and whether their Briese family is related to other Briese families. Paper records provide some answers, but in many cases, these are missing, have critical gaps, or do not go back far enough to provide the evidence needed. As both the surname and the Y-chromosome are passed down the male lineage of a family, genetic genealogy provides a complementary approach that can help unravel the answers to these questions.

This paper describes a study, set up in 2011<sup>7</sup> to describe the phylogenetic relationships between people bearing the surname Briese, based on the comparison of genetic markers on male Y-DNA. As well as determining patterns of family relationship, the results of such a study could also clarify conjecture on the origins of the Briese name.

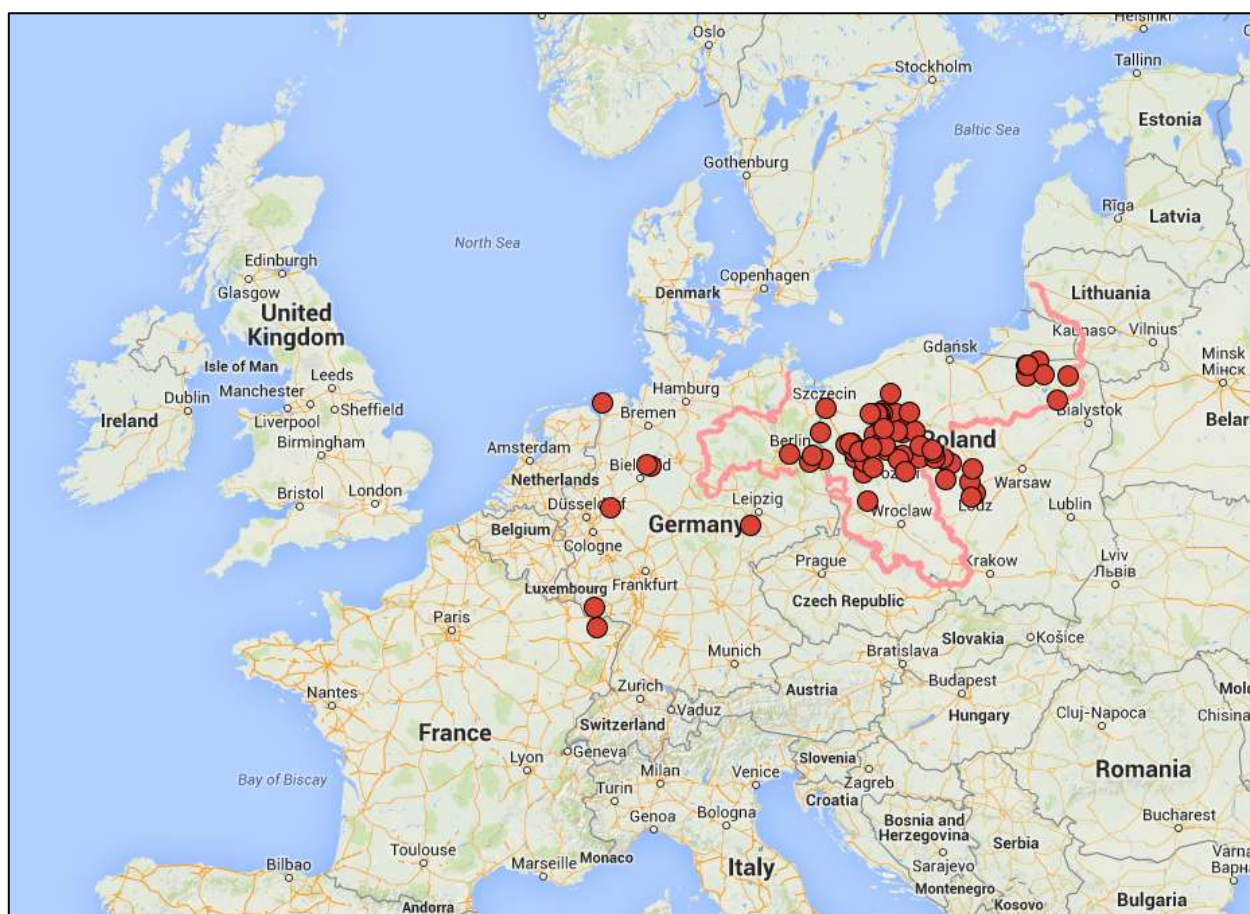


Fig.1. Locations where the Briesie surname appears in birth, death and marriage records from the 18<sup>th</sup> and early 19<sup>th</sup> century<sup>3,4,5,18</sup>. The borders of the former eastern part of Prussia are shown in pink. Base map data©2014 Google.

Table 1. Regions of Prussia with relatively high densities of the Briesie name in 18<sup>th</sup> and early 19<sup>th</sup> century records.

Province	District	Province	District
Brandenburg	Landsberg/Warthe	Posen	Meseritz
Brandenburg	Lebus	Posen	Czarnikau
East Prussia	Gerdauern	Posen	Schwerin
Greater Poland	Lodz	West Prussia	Deutsch Krone

## Methods

### Raw data

To date, nine individuals with the surname Briesie have contributed Y-DNA samples for analysis. These individuals descend from families that migrated to North America and Australia and, in all but two cases, can trace their family back to a specific location in Prussia. Genetic analyses were carried out by FTDNA (Family Tree DNA)<sup>8</sup>. The recommended test for 37 STR (short tandem repeat) markers on the Y-chromosome was used, as

the 12- and 25-marker sets offered are insufficient to determine relationships as accurately as required.

Individuals participating in this study are identified here by a 6-letter code to protect privacy. The code also identifies the location of the place where the earliest known ancestor of each individual lived (see Table 2). The data set of 37 STR markers is shown in Fig. 2.



raw DNA data (see Table 2) was then analysed using the open source software package Network 4.162 (Fluxus Engineering)<sup>12</sup> to show those STR markers that have mutated from the ancestral haplotype, the pattern of divergence of individuals from this modal value and the relative positions of individuals to one another.

## Results

### Genetic distances and the phylogenetic tree

Eight of the nine individuals belong to haplogroup r1b1 and the other (PR) to haplogroup r1a (Table 3), indicating a long genetic separation between them. The matrix of genetic distances between pairs of Briese individual haplotypes (Table 3)

confirms this and refines the relationships between the group of eight.

According to the FTDNA interpretation of genetic distance<sup>13</sup>, a distance of 1 indicates a tight relationship, 2-3 indicates that they are related, 4 indicates a probable relationship, 5 a possible relationship and 6 or more suggests relationships may pre-date the time when people in Europe adopted surnames. Given that Po-WiPo1 and Po-WiPo2 are from the same family originating from Potrzymowo, Posen, it is not surprising that the genetic distance is so close (=1). This family has been in Australia since 1855. However, these two are also genetically close (distances = 2-3) to the three individuals originating from Deutsch Krone, Westpreussen (Wp-DKKN, Wp-DKNg and Wp-DKAp). The families of Wp-DKKN and Wp-DKNg

Table 3. Matrix of genetic distances between pairs of Briese individuals (1-3 = related, 4-5 = probably related)

ID	P-WiPo1	P-WiPo2	P-KoSo	W-DKKN	W-DKNg	W-DKAp	P-MeMe	PR	Si-BrBr
P-WiPo1		1	1	1	1	2	4	15	19
P-WiPo2			2	2	2	3	5	15	19
P-KoSo				2	2	3	4	16	18
W-DKKN					2	3	5	16	19
W-DKNg						3	5	15	19
W-DKAp							6	16	18
P-MeMe								18	20
PR									21
Si-BrBr									

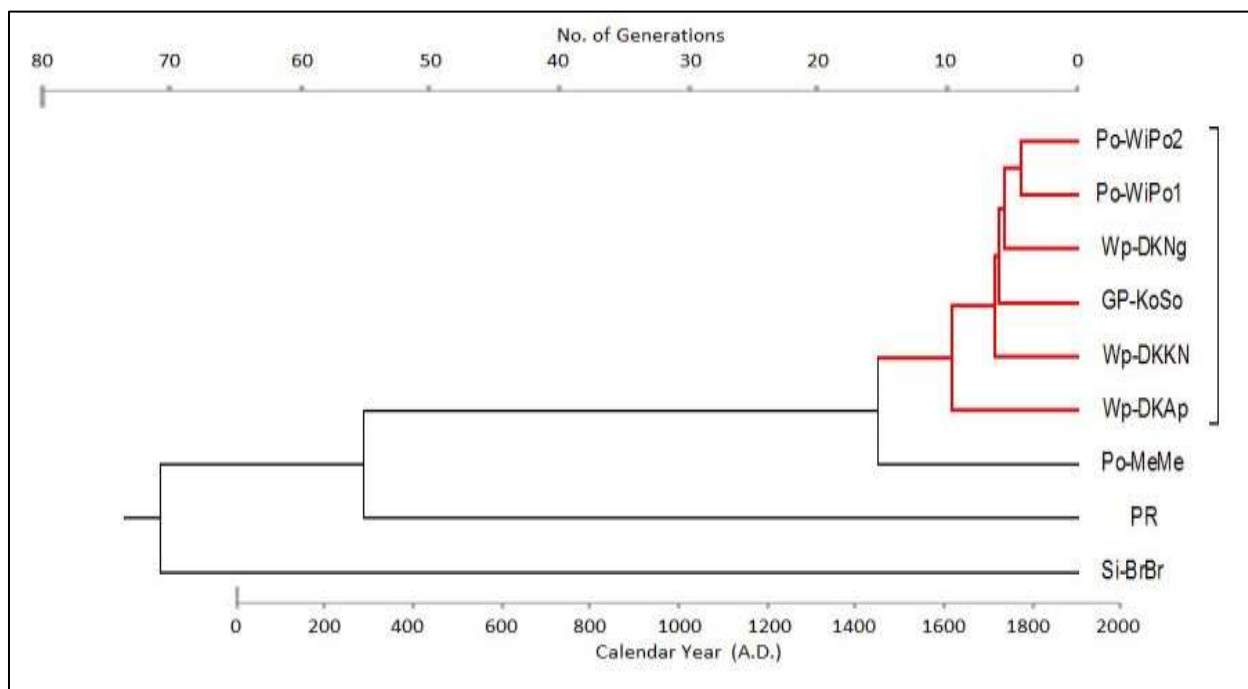


Fig. 3. Phylogenetic relationships of nine Briese individuals from eight separate “families”. Each individual is identified by a code indicating the place where their earliest known ancestor was born or lived (see methods). The top axis shows the number of generations before now and the bottom axis is the calendar year (based on a 32-year generation interval).

emigrated independently to Australia and the family of Wp-DKAp emigrated to the USA. No connection had been found between these four families in paper records (births, deaths and marriages), but the y-DNA evidence demonstrates that they have a relatively recent common origin. The times to the most recent common ancestor of pairs of individuals indicate that were part of a common family about seven generations ago. A fourth family line, GP-KoSo which emigrated from nearby Sompolno to the United States, also forms part of this related cluster (distances = 1-3).

Po-MeMe, originating from Meseritz, Posen, and now based in the USA, is genetically more separated from this group (distances = 4-6) and, when individual pairs are considered, borders on the limit of what FTDNA considers evidence for a relationship. However, the results need to be interpreted in terms of the overall pattern of genetic distances (see Fig. 3). The phylogenetic tree in Fig. 3 suggests that the split between the Meseritz family and the others occurred around 15 generations ago, i.e. in the early 16th century.

The last two individuals are clearly unrelated to the

other six or to each other in genealogical time, showing very large genetic separation from them (distances = 22-29). As mentioned above, one even belongs to a different haplogroup (R1a) than members of the cluster (R1b). One of these is from a family that emigrated to the USA in the 19th century, but of unknown origin (other than Prussia). The other is from a family that emigrated from Silesia to the USA in the mid-20th century and whose oral tradition is of a Prussian origin.

### Network Analysis

The results of the network analysis are shown in Fig. 4, which includes the whole network generated for the nine individuals and an enlargement of the nodal area. The network indicates that the unrelated individuals (PR and Si-BrBr) are separated from a grouping formed by the remaining seven. The pattern of this cluster (see enlargement) is suggestive that there could be further sub-division.

Po-WiPo1 has a STR marker set that is identical to the modal haplotype. He is also known to be related to Po-WiPo2 from paper records, who together with GP-KoSo, Wp-DKKN, Wp-DKNG and

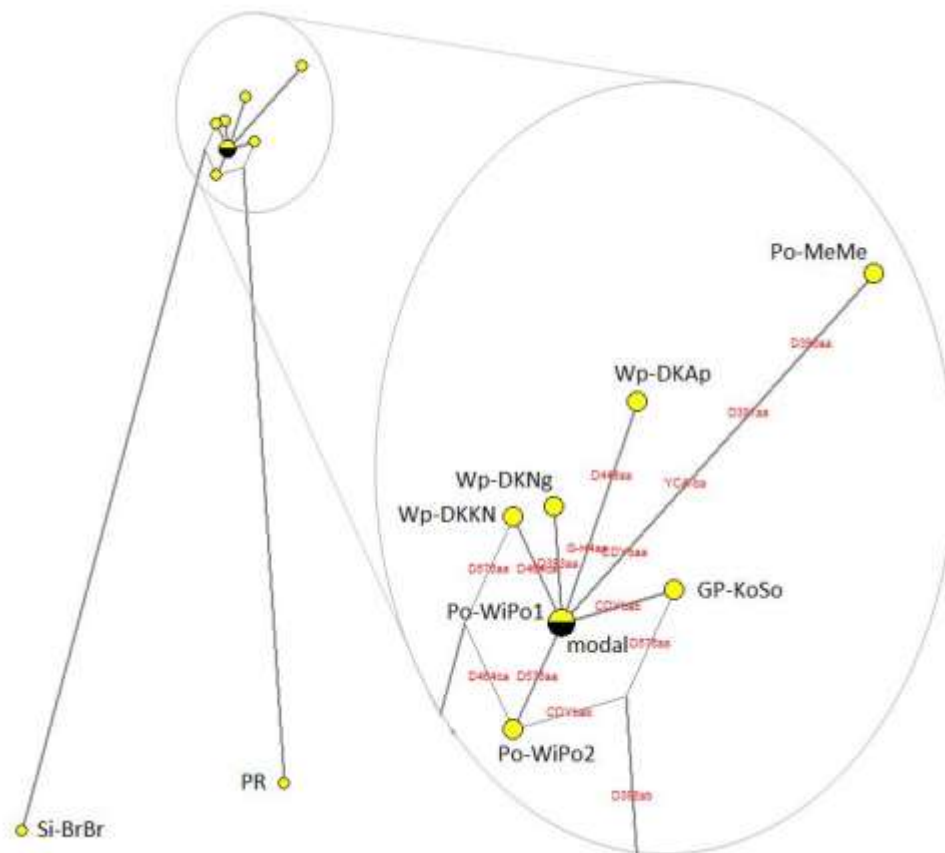


Fig. 4. Phylogenetic network for nine individuals with the surname Briese. The left-hand figure shows the full network and the right-hand figure is an enlargement of the upper cluster. The modal haplotype is shown in black and mutations from the modal haplotype are indicated in red (see text for details).

Wp-DKAp all lie within 1-2 mutations of the modal haplotype. These form a putative grouping of more closely related individuals and define the “Deutsch Krone” cluster, based on a region in West Prussia which in the 18<sup>th</sup>-19<sup>th</sup> centuries had a relatively high density of Briese surnames <sup>14</sup>. Po-MeMe, who originates from a different region, deviates from the modal value by four mutations and is less closely related to those within the cluster.

## Discussion

A sample size of nine is small and, as a result, findings should be viewed as indicative. That said, the results have shown that genetic studies can make an important contribution to genealogy. They show that there are currently three distinct and unrelated lineages amongst people bearing the Briese surname.

Six of the individuals, two from Potrymowo, Posen, three from Deutsch Krone, West Prussia (from the villages of Appelwerder and Neugolz, respectively) and one from Sompolno in Greater Poland, belong to a related cluster of Brieses, which was not demonstrable from paper records. The validity of this cluster is supported by two different lines of evidence. In the FTDNA y-search database <sup>14</sup> of over 139,000 records, only one other person of different surname could possibly have been related (genetic distances of 3-5) at the 37-marker level, and this was subsequently disproved by a 67-marker STR comparison. Moreover, Immel et al. (2009) <sup>15</sup> found a high degree of correlation between surname and Y-STR haplotype in the East German population, suggesting that “Y-chromosomal genetic structure of modern Central European populations is heterogeneous and that, particularly in East Germany, the concomitant strata may be resolvable by the consideration of surnames” <sup>15</sup>. Thus the close genetic relationships of these Briese individuals are highly unlikely to be due to chance.

The Y-DNA data suggests that the common ancestor lived in the late 17<sup>th</sup> or early 18<sup>th</sup> century. As mentioned previously, church records from the Lüben Evangelical Parish <sup>16</sup> show that there were a large number of Brieses in the Deutsch Krone district, as far back as the mid-18<sup>th</sup> century. By contrast, the related Briese family from Potrymowo is the only one in the Czerniejewo Evangelical Church Records <sup>17</sup>. This suggests that the family may have moved to that area from

Deutsch Krone just prior to the dates of surviving paper records. With local movements such as these, geography alone does not define a family cluster.

The individual originating from Meseritz also appears to be related to the Deutsch Krone cluster, but more distantly, dating back perhaps to the 15<sup>th</sup> century. Given the large number of Briese records in the Meseritz church book <sup>3,18</sup> in the 18<sup>th</sup> and 19<sup>th</sup> century, it seems likely that this region comprises a distinct cluster of Briese families. Further testing of individuals originating from Meseritz is needed to verify this. The Deutsch Krone Brieses could originate from Meseritz, or both clusters might originate from a common ancestor who lived in another region. Again more samples are needed to explore these possibilities.

With regard to the unrelated individuals, there are two possibilities; 1) they are descended from ancestors who independently took on the name Briese when surnames were being adopted, which was probably during the 15<sup>th</sup> century in eastern Prussia <sup>15</sup> or 2) the surname lineage and genetic lineage have become disjunct at some stage during the generations elapsed since that time (e.g. in the case of adoption). In the latter case, King & Jobling (2009) <sup>19</sup> reported that the rate of such events for English surnames was 2% per generation. This gives a 26% probability of a major genetic shift in a surname lineage in the 15 or so generations since the name was adopted, which is close to the 22% (2/9) of Briese individuals that were genetically unrelated to the others. That said, this does not disprove the possibility of multiple independent origins of the name and, in either case, these individuals are part of distinct lineages of the Briese surname. More samples might provide evidence whether or not these have also developed into distinct clusters of related families.

These results demonstrate that genetic genealogy is able to clarify relationships between families where paper records are missing. Several families from the Deutsch Krone area, other than those mentioned here, emigrated to Australia <sup>20</sup> and North America <sup>6</sup> and Y-DNA comparisons of their members should show how they are related. Broader sampling of Briese families from other areas should also be able to show whether the different clusters have originated independently or not. In the latter case, it should be able to show the patterns in related family clusters of a diverging lineage from a distant common ancestor.

More sampling is needed to clarify the relationships within family clusters and also the broader patterns of kinship between Briese families originating from different geographic regions. Based on the preliminary findings of this study, this should include:

- 1) broad-based sampling to discover whether there are more lineages to the Briese surname than the three already identified,
- 2) a mix of broad-based and targeted sampling to determine whether family-clusters exist within the two currently-isolated lineages and whether their geographic origins can be determined, and
- 3) targeted sampling to refine and add to kinship patterns amongst known families of the third lineage comprising Meseritz and the Deutsch Krone cluster.

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