

# Pies of the Blind

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STATISTICAL GRAPHICS GROUP - SPRING 2016

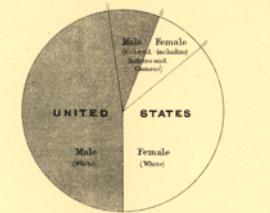
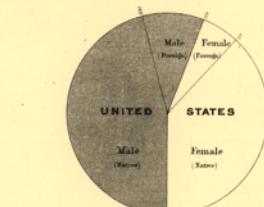
Areas of circles proportional.  
Scale: 4800 to the square inch.

### CHART SHOWING THE AGGREGATE NUMBER OF THE BLIND

AND THE PROPORTION OF MALES AND FEMALES,  
WHITE OR COLORED, NATIVE OR FOREIGN,

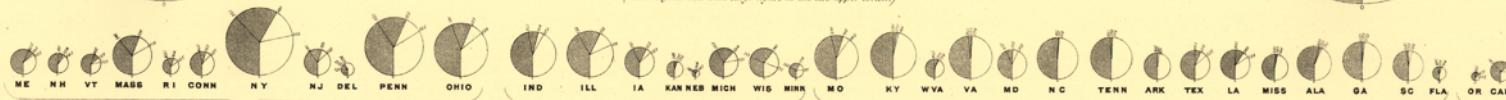
AT THE NINTH CENSUS 1870;  
also the increase since 1860.

PREPARED FOR THE STATISTICAL ATLAS OF THE UNITED STATES  
by FRED. H. WINES Secy Illinois State Board of Charities.



I. Comparative view of the distribution of Blindness by sex and nativity in the several States.

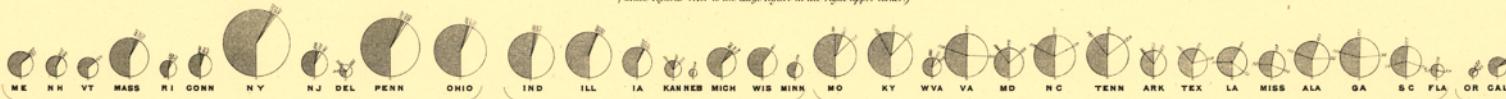
(These figures refer to the large figure in the left upper corner.)



I.  $^{\circ}$  opposite first radius from Zero to left denotes degrees in sector for Native Males, that opposite first radius to right from Zero, degrees in sector for Native Females, and that opposite second radius to right, the sum of the degrees in the two sectors for Females, Native and Foreign.

II. Comparative view of the distribution of Blindness by sex and color.

(These figures refer to the large figure in the right upper corner.)



II.  $^{\circ}$  opposite first radius from Zero to left denotes degrees in sector for White Males, that opposite first radius to right from Zero, degrees in sector for White Females, and that opposite second radius to right, the sum of the degrees in the two sectors for Females, White and Colored.

III. Comparative view of the increase in the number of the Blind between 1860 and 1870.



III. Inner circles represent numbers reported at 1860; outer circles, numbers at 1870;  
the shaded ring, the increase in the interval.

# Background

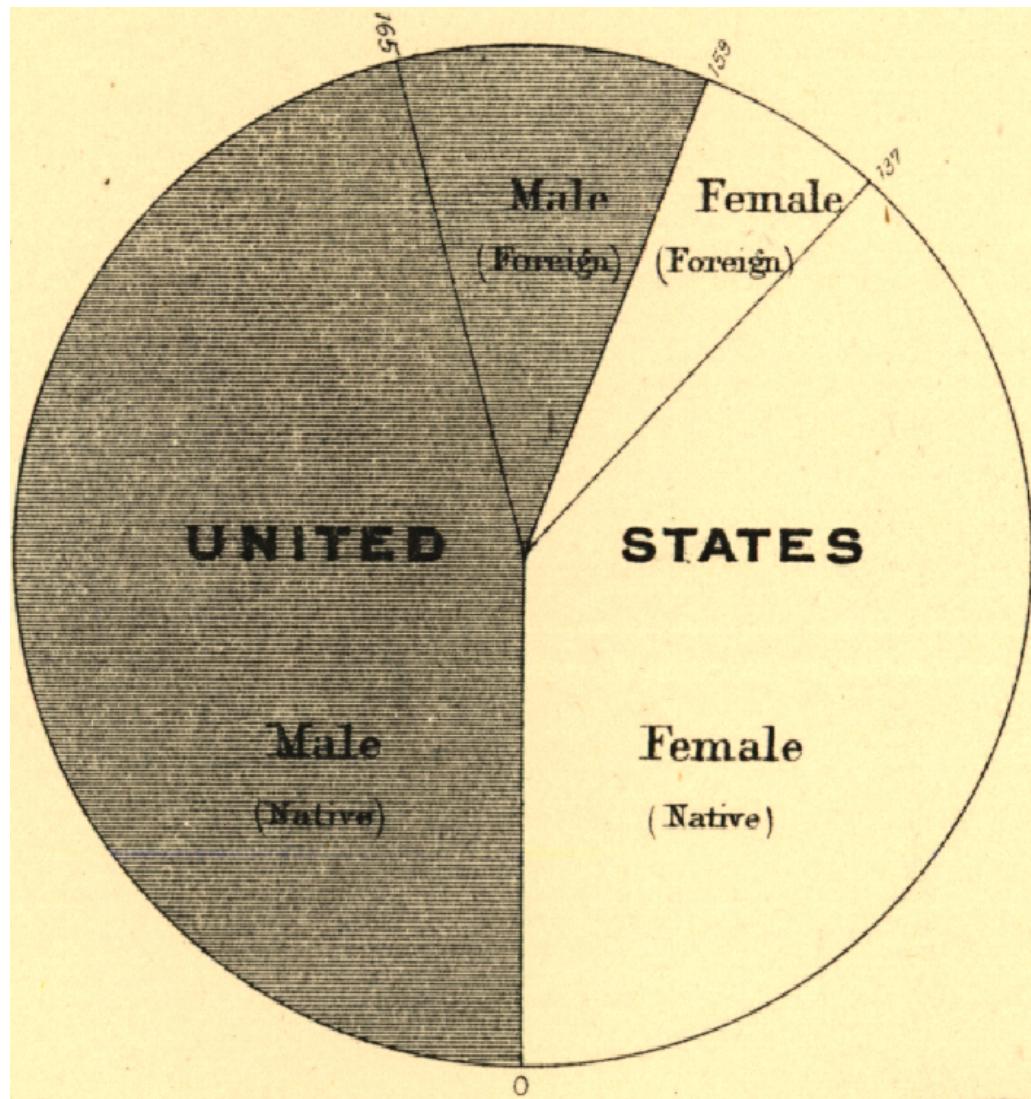
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“Chart showing the aggregate number of the blind” published in 1874,  
last page of the census

Fred H. Wines, Secretary of the Illinois State Board of Charities

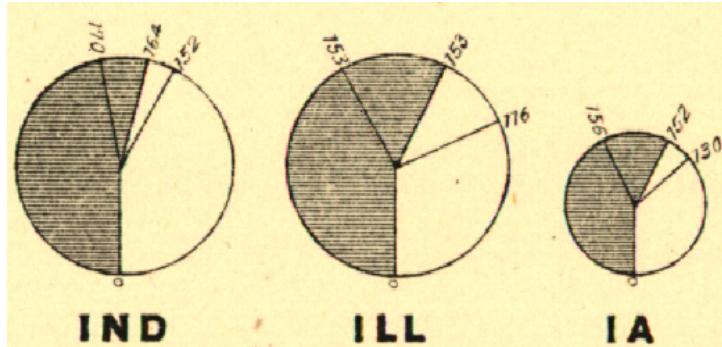
**Github:** <https://github.com/heike/discussion-1874>

**Chart:** <https://www.loc.gov/resource/g3701gm.gct00008/?sp=104>



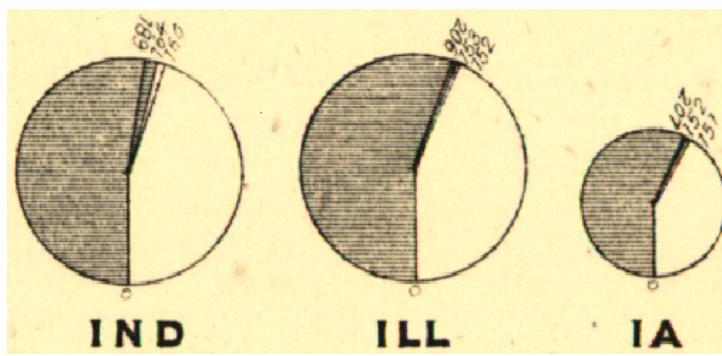
- **Area** of each pie is proportional to the # of blind individuals in each state
- **Angles** segment # of individuals by gender, nativity, or race.
- **Area between circles**, represent the change in the number of blind individuals between 1860 and 1870
- Pies in each row are **grouped** into 4 regions (Eastern, Western, Southern, and Pacific)

*Areas of Circles proportional:  
Scale : 4800 to the square inch.*

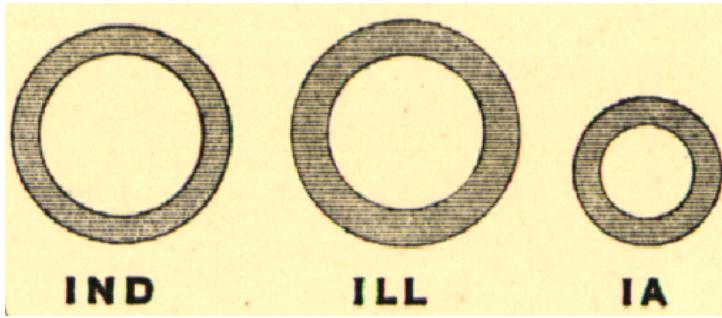


**Gender**  
x  
**Nativity**

- **Area** of each pie is proportional to the # of blind individuals in each state
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**Gender**  
x  
**Race**



**1860 Blind**  
vs  
**1870 Blind**

*Areas of Circles proportional:  
Scale : 4800 to the square inch.*

*“the males are shown to be in excess among the blind, the deaf mutes and the idiots; the females among the insane.*

*The foreigners are shown to be in excess of their proportion among the blind and the insane; the natives among the deaf mutes and the idiots...”*

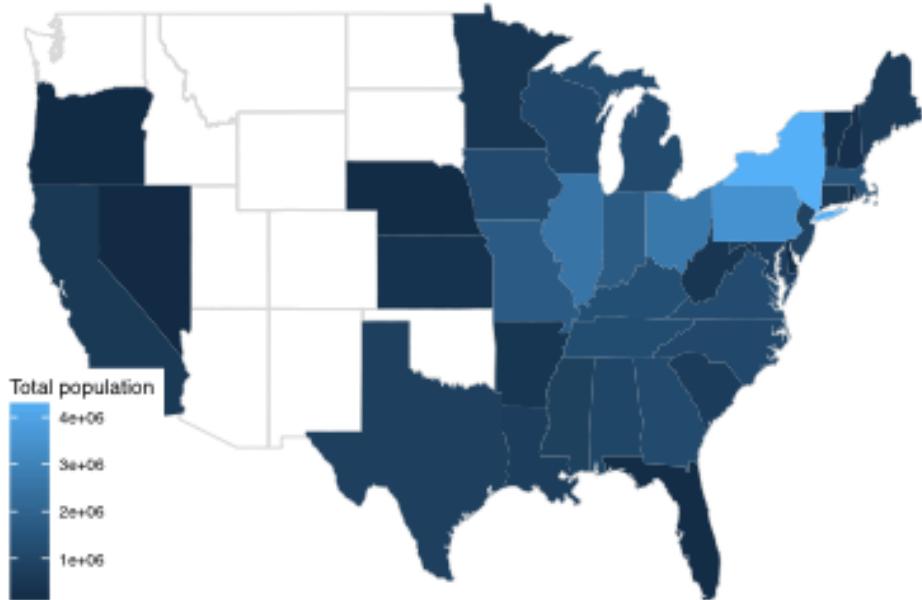
(Walker, 1874, pg 3)

# Data Acquisition

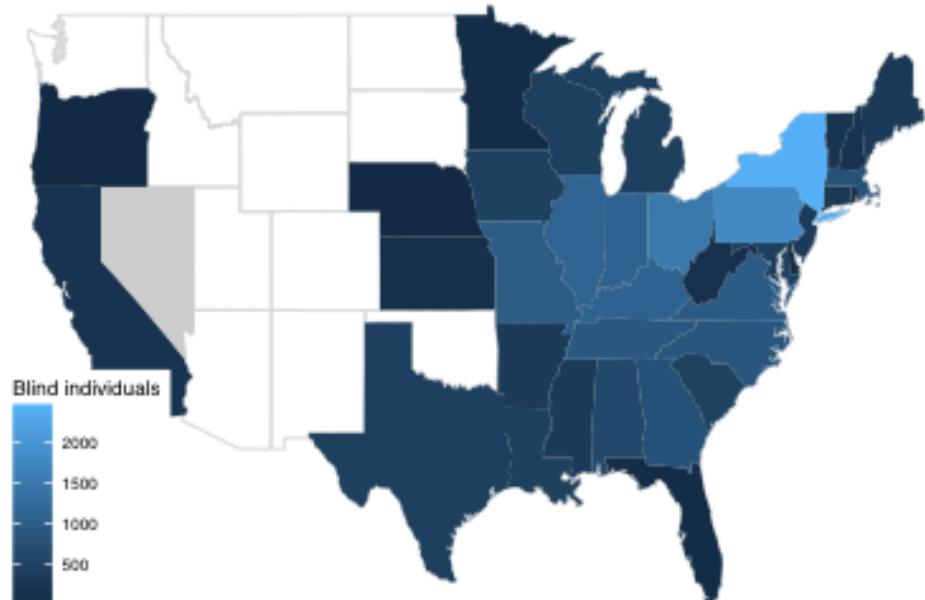
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- **Individual Records:** ancestry.com, FamilySearch, etc allow records by name. For example, in the 1870 census there are 391 individuals listed by the name Helen Keller, who are white females (not THE Helen Keller since she was born in 1880)
- **State aggregate data:** Historical Census Browser. Only contained political and economic factors with no social aspects such as disability
- **Census microsamples:** ipums USA at <https://usa.ipums.org/usa/>, fetched 1.2% to estimate total population.

(a) Fill color is total population.



(b) Fill color is (estimate) of blind population.

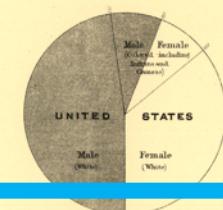
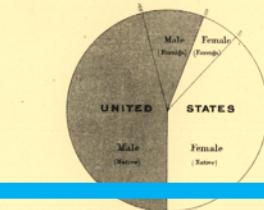


States in 1870, colored by total population (left) or estimate of blind population (right)  
The value for Nevada is missing from the second figure, because it is missing from Wine's pie chart. Uncertain why...

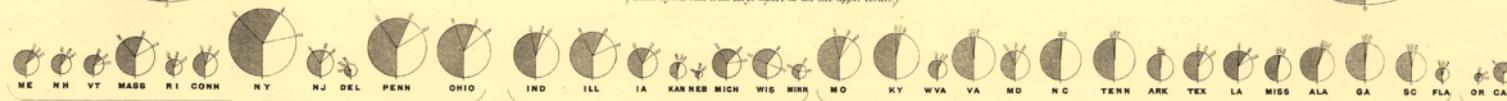
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**CHART**  
SHOWING THE AGGREGATE NUMBER OF THE

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also the increase since 1860.  
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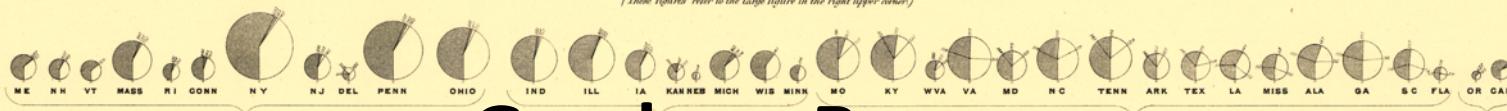


(These figures refer to the large figure in the left upper corner.)



# Gender x Nativity

**II. Comparative view of the distribution of Blindness by sex and color.**  
*(These figures refer to the large figures in the right upper corner.)*



# Gender x Race

### III. Comparative view of the increase in the number of the Blind between 1860 and 1870.



# WESTERN SOUTHERN 1860 Blind vs 1870 Blind

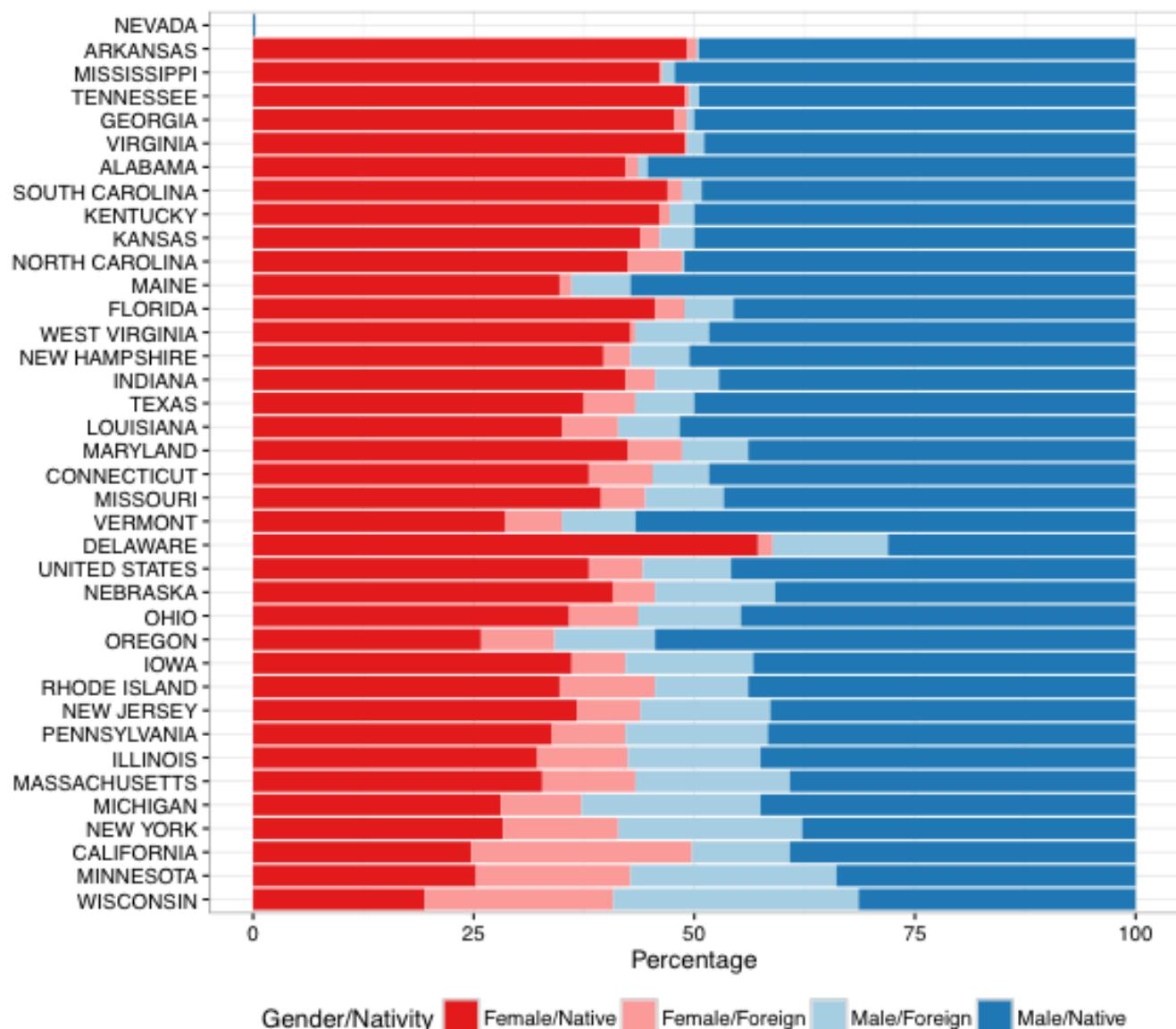


Fig. 5: Overview of the proportion of the blind by gender and nativity. Wisconsin has the highest number of foreign born blind, Arkansas has the fewest. Delaware is the only state in which there are more blind women than men. Just below Delaware are the proportions for the whole nation.

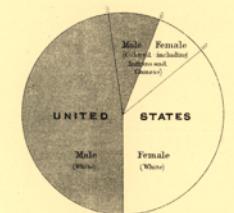
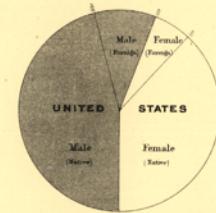
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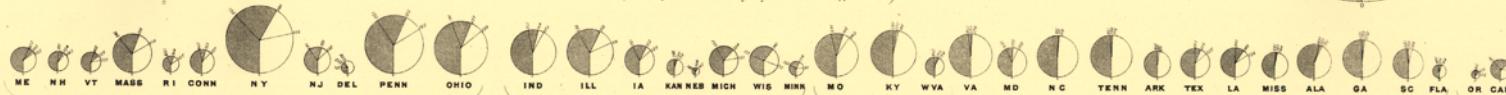
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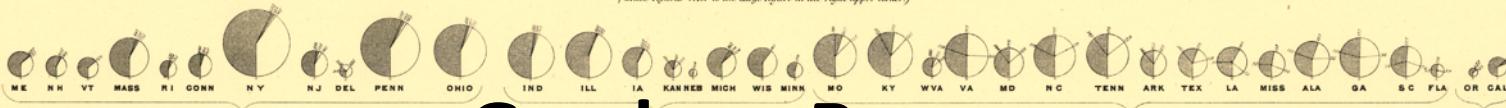


I.Comparative view of the distribution of Blindness by sex and nativity in the several States.  
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# Gender x Nativity

II.Comparative view of the distribution of Blindness by sex and color.  
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# Gender x Race

III.Comparative view of the increase in the number of the Blind between 1860 and 1870.



# 1860 Blind vs 1870 Blind

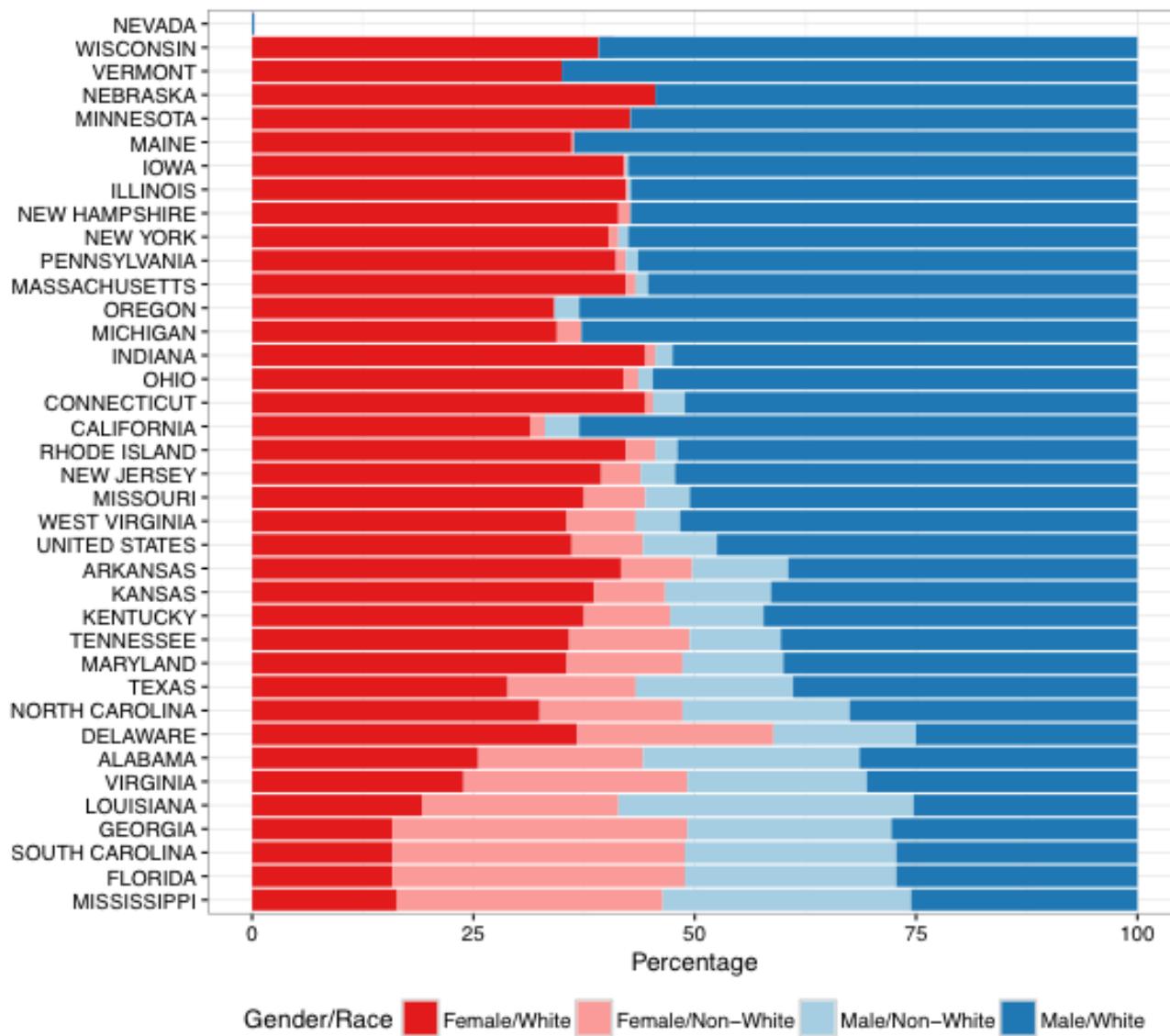


Fig. 6: Overview of the proportion of the blind by gender and race, sorted according to proportion of white/non-white blind. Southern states have a much higher proportion of non-white blind, reflecting the demographics of the total state population. Both Illinois and New York have surprisingly high proportions of whites (8th and 10th place) among their blind population.

Areas of circles proportional  
Scale: 4800 to the square inch.

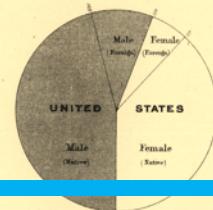


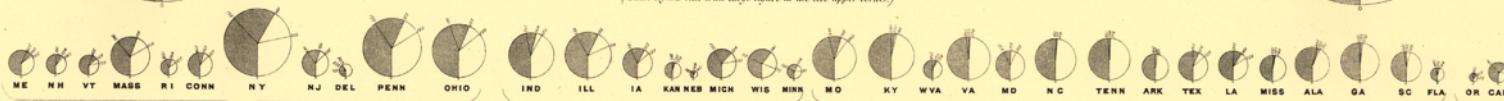
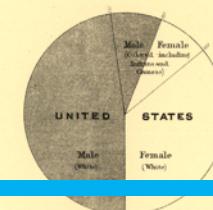
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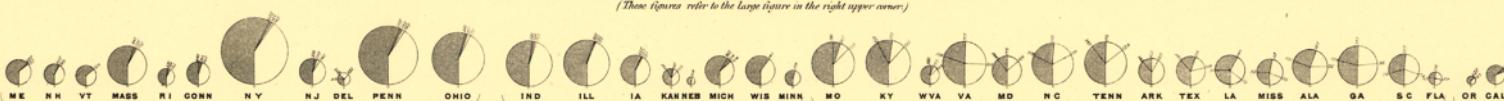
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# Gender x Nativity

II. Comparative view of the distribution of Blindness by sex and color.

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# Gender x Race

III. Comparative view of the increase in the number of the Blind between 1860 and 1870.



# 1860 Blind vs 1870 Blind

# Significantly too many or few?

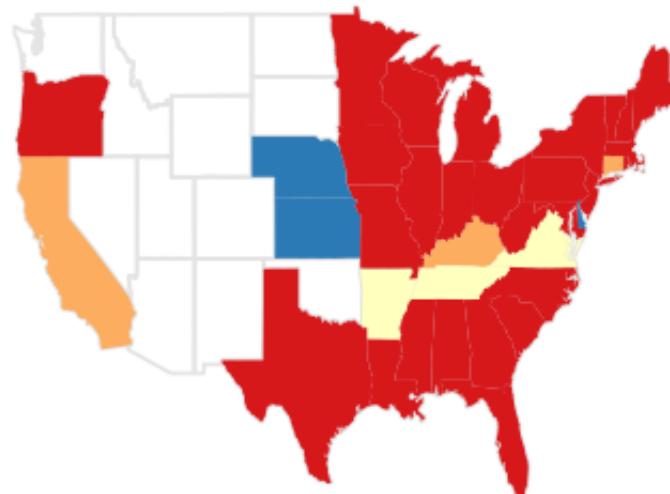
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- **Expected** proportion of blind (per group) derived from 1.2% census micro samples
- **Observed** proportions of blind (per group) given by Wines' chart

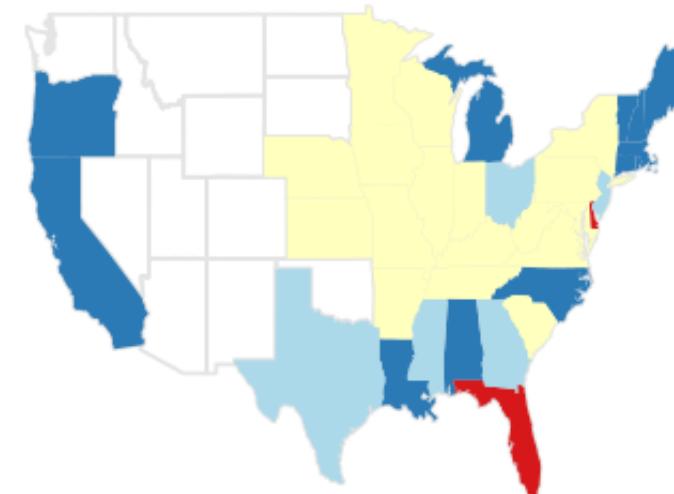
Relative deviations for each of these groups and each state are then defined as:

$$D = \frac{obs - exp}{\sqrt{exp}}.$$

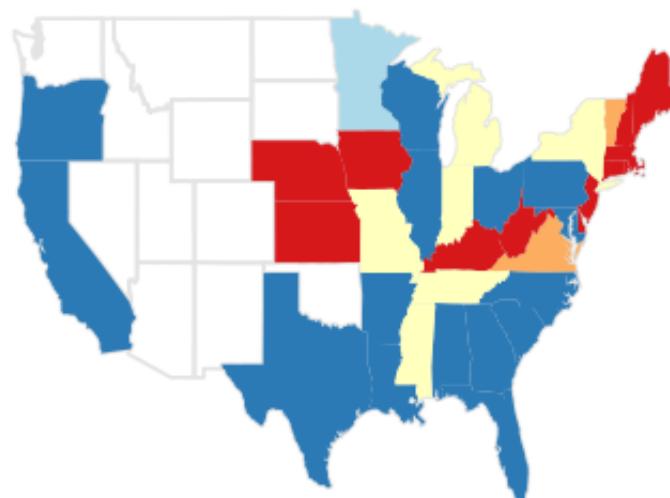
Female/Native



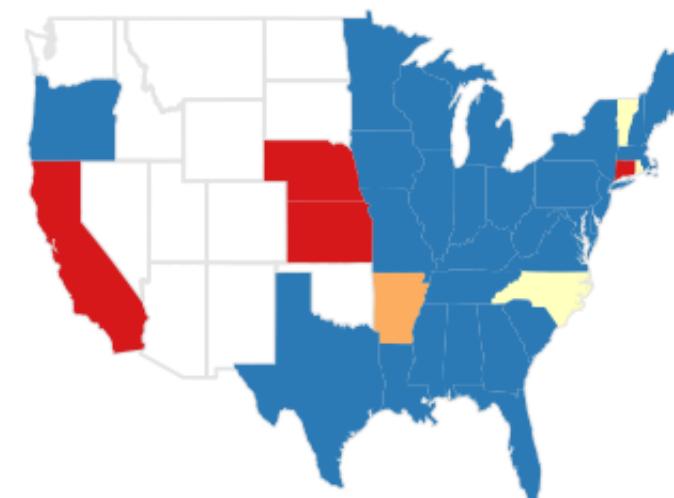
Male/Native



Female/Foreign



Male/Foreign



Deviation

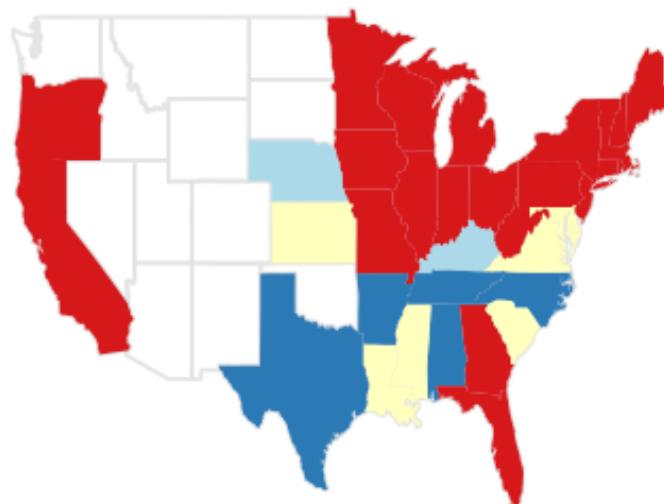
significantly too many ( $p < 0.01\%$ )significantly too few ( $p < 0.05\%$ )significantly too many ( $p < 0.05\%$ )

as expected

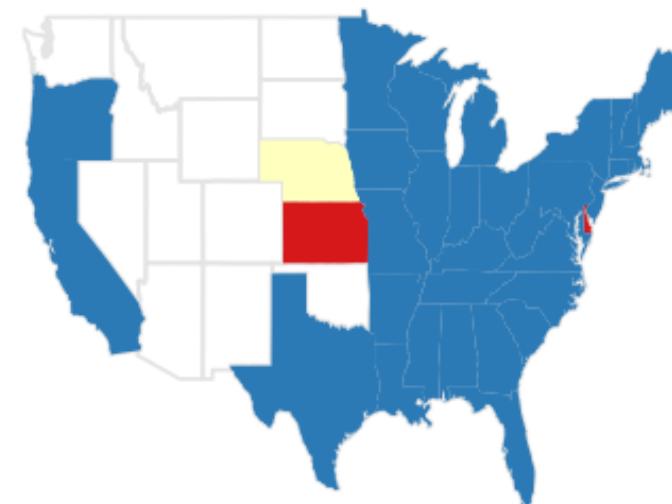
significantly too few ( $p < 0.01\%$ )

# Where are the Women and People of Color?

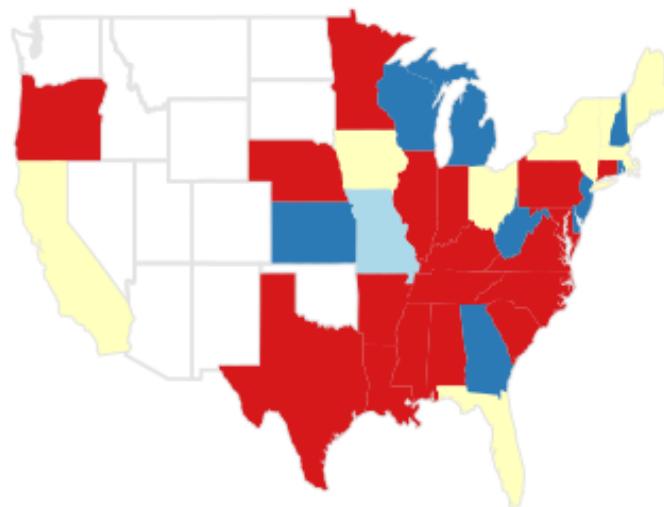
Female/White



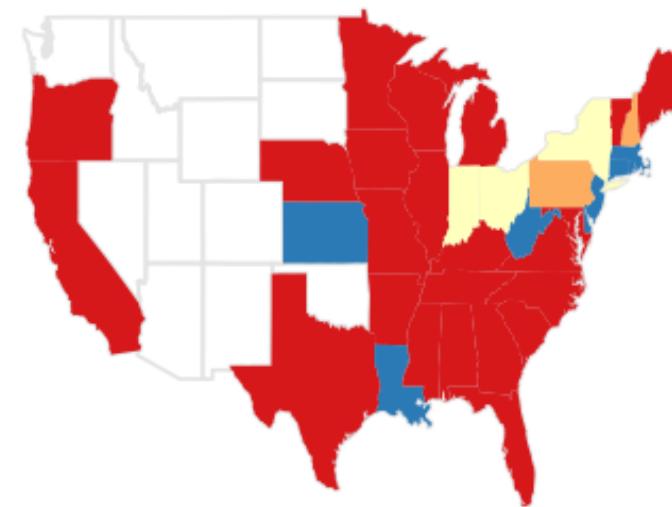
Male/White



Female/Non-White



Male/Non-White



Deviation



significantly too many ( $p < 0.01\%$ )



significantly too many ( $p < 0.05\%$ )



as expected



significantly too few ( $p < 0.05\%$ )



significantly too few ( $p < 0.01\%$ )

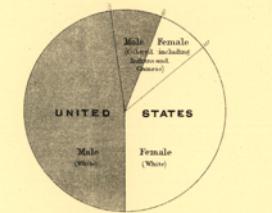
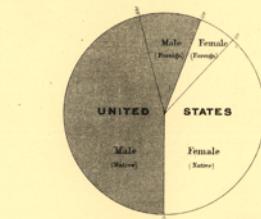
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Scale: 4800 to the square inch.

CHART  
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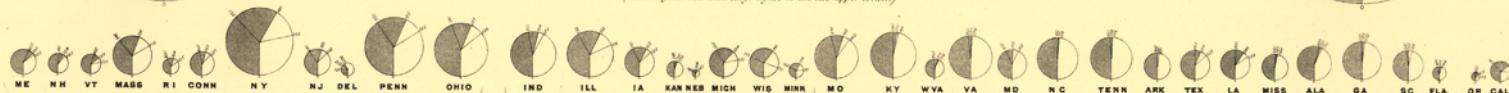
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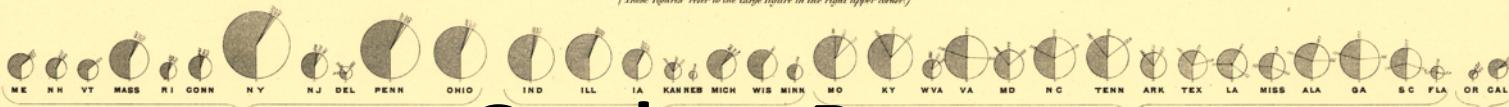


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# Gender x Nativity

II.Comparative view of the distribution of Blindness by sex and color.  
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# Gender x Race

III.Comparative view of the increase in the number of the Blind between 1860 and 1870.



# 1860 Blind vs 1870 Blind

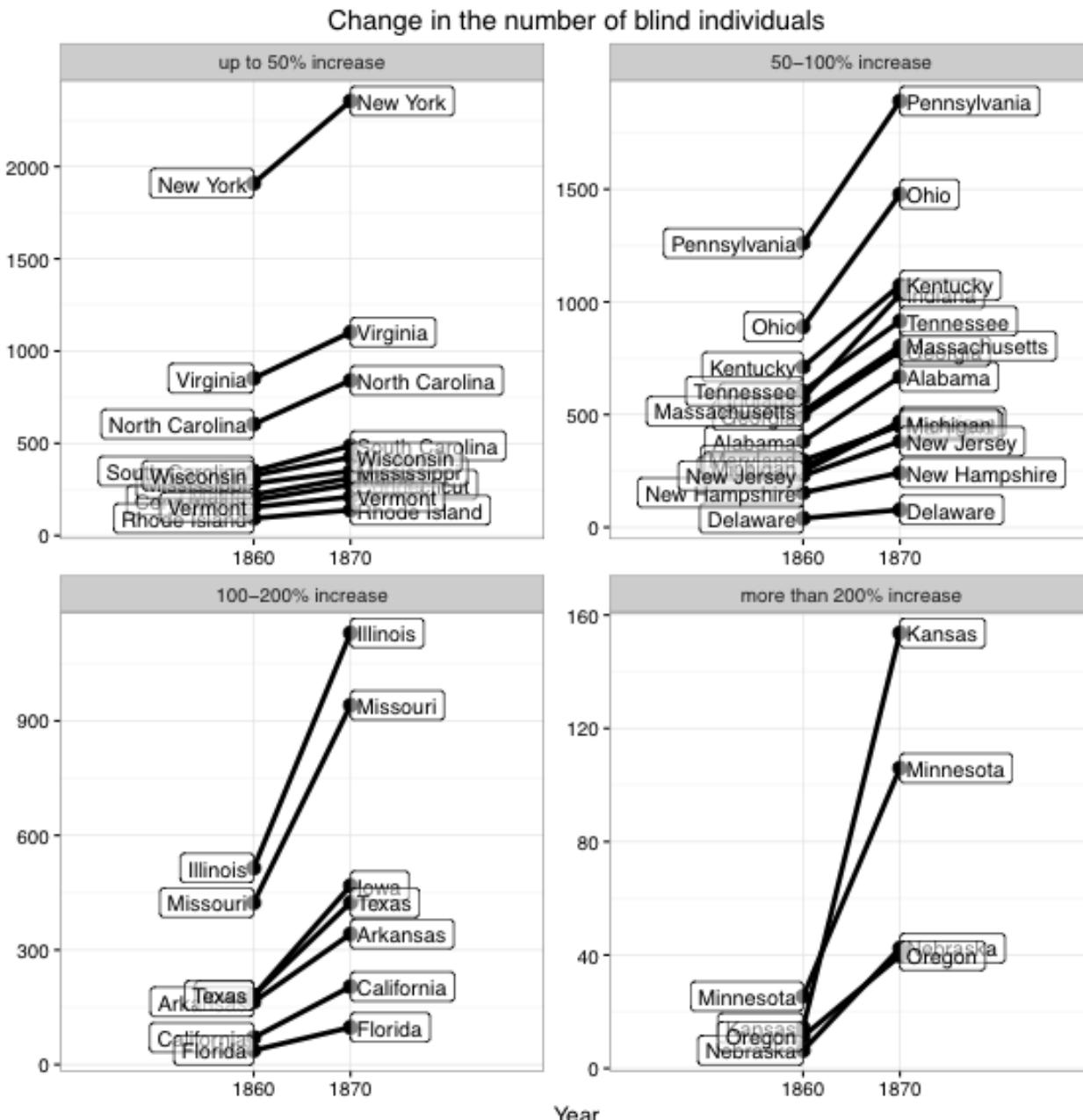


Fig. 9: Change in the number of blind individuals per state from 1860 to 1870. All states see an increase of more than 22.5%, the average increase in the general population during that time.

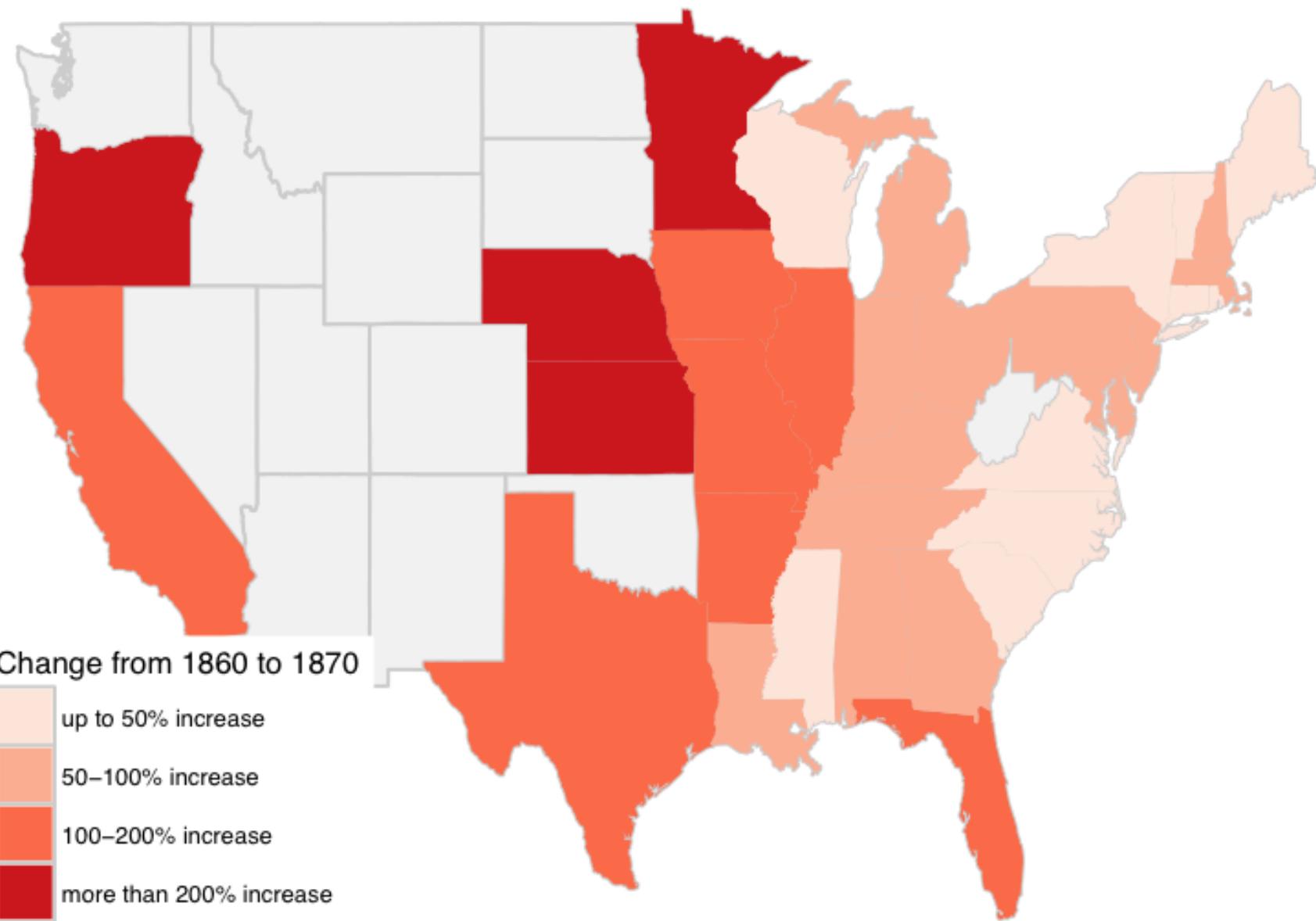


Fig. 10: Choropleth map of a geographic overview of the changes in the number of blind between 1860 and 1870.

# Conclusions

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Proportion of blind individuals among foreigners is high for states that have been founded within two decades prior to census (WI, IA).

Uncertain why Nevada was left out of Wines' chart

WI has highest number of foreign born blind

AK has the fewest

DE only state where more blind women than blind men

Southern states have a much higher proportion of non-white blind

IL, NY have a surprising high proportion of blind white

By far, too few native born blind women in all but KS and NE.

Significantly too many foreign born blind individuals