



Transportation Safety Fundamentals: Connecting the DOTs to High Risk Drivers

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How many of you have conducted studies
of high risk drivers or identification of
regions with risky driving?



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Example of use of “scientific methods” to
this problem.



Traditional Approach

Use county-level crash data to identify regions of highest average (i.e.) expected number of crashes



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May also add demographic data to identify regions with different user characteristics (e.g. Agüero and Jovanis; Quddus and Noland)



County-level Approach

- Predict crashes associated with:
 - County-level socio-demographics (e.g. median or mean age, income, % below poverty)
 - Infrastructure-related measures (e.g. lane miles or miles by road class)
 - Environmental measures (e.g. annual rainfall, snowfall)
 - Enforcement occasionally included (e.g. citations)



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Advantage: Utility for targeting enforcement; gain knowledge of aggregate user attributes if use demographic data



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*Difficulty: People have crashes not counties. How do you identify individual drivers? **How high is too high?***



Different Approach

One that compares drivers with those that are *SIMILAR* (e.g. age, gender)

Try to use information about similar drivers and their records to make better decisions about the risk level of a particular driver

Approach used in identifying highway segments for treatment (Sites with Promise or SWiPs)



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Leads to: Drivers with Promise (DWiPs)

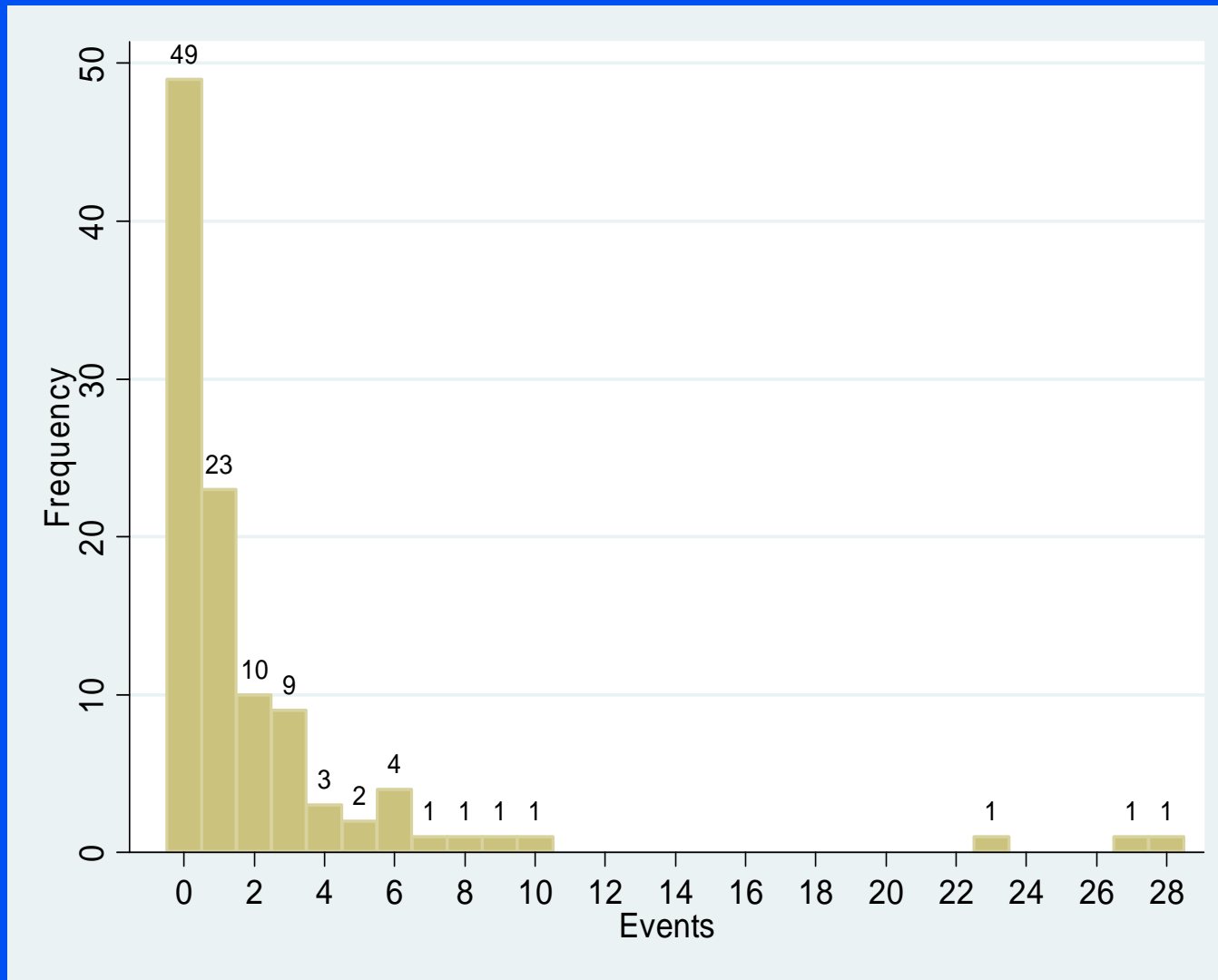


Identification of DWiPs

- Records of crashes (citations) associated with individual drivers
- Multiple years
- Model:
 - Probability of having 0,1,2,3 . . . Crashes or citations in a year
 - Plot average for each driver as shown



Events per Driver

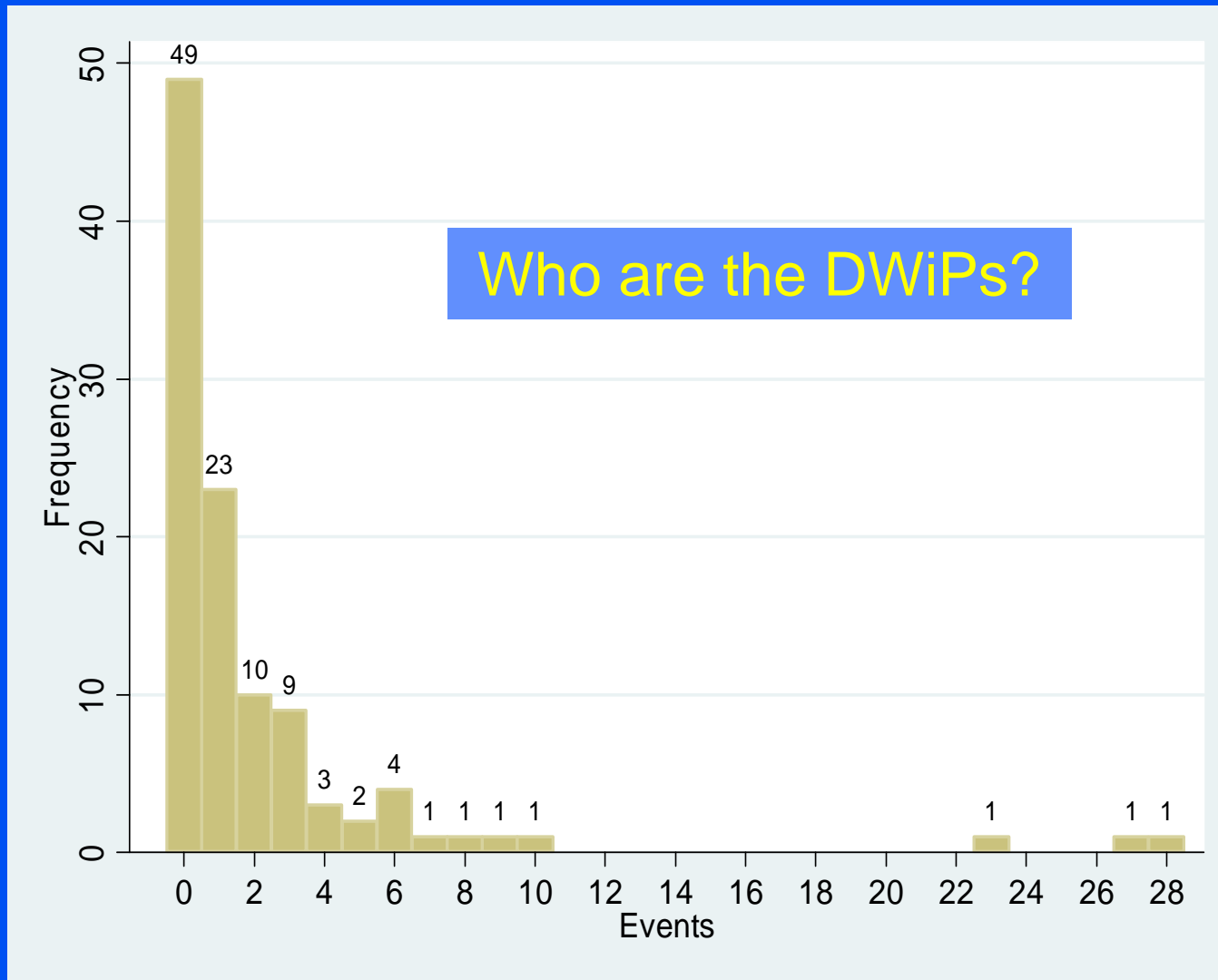


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Events per Driver

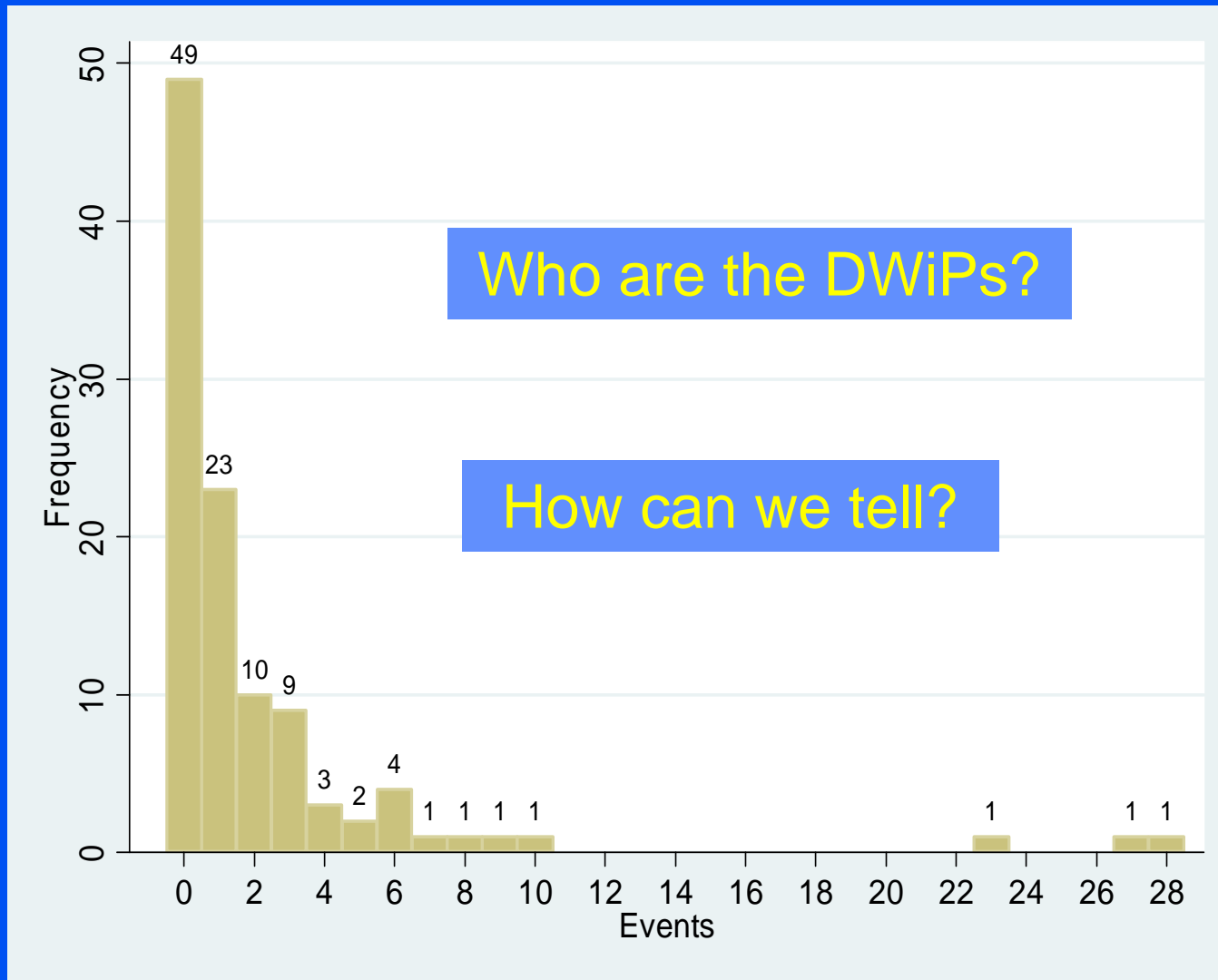


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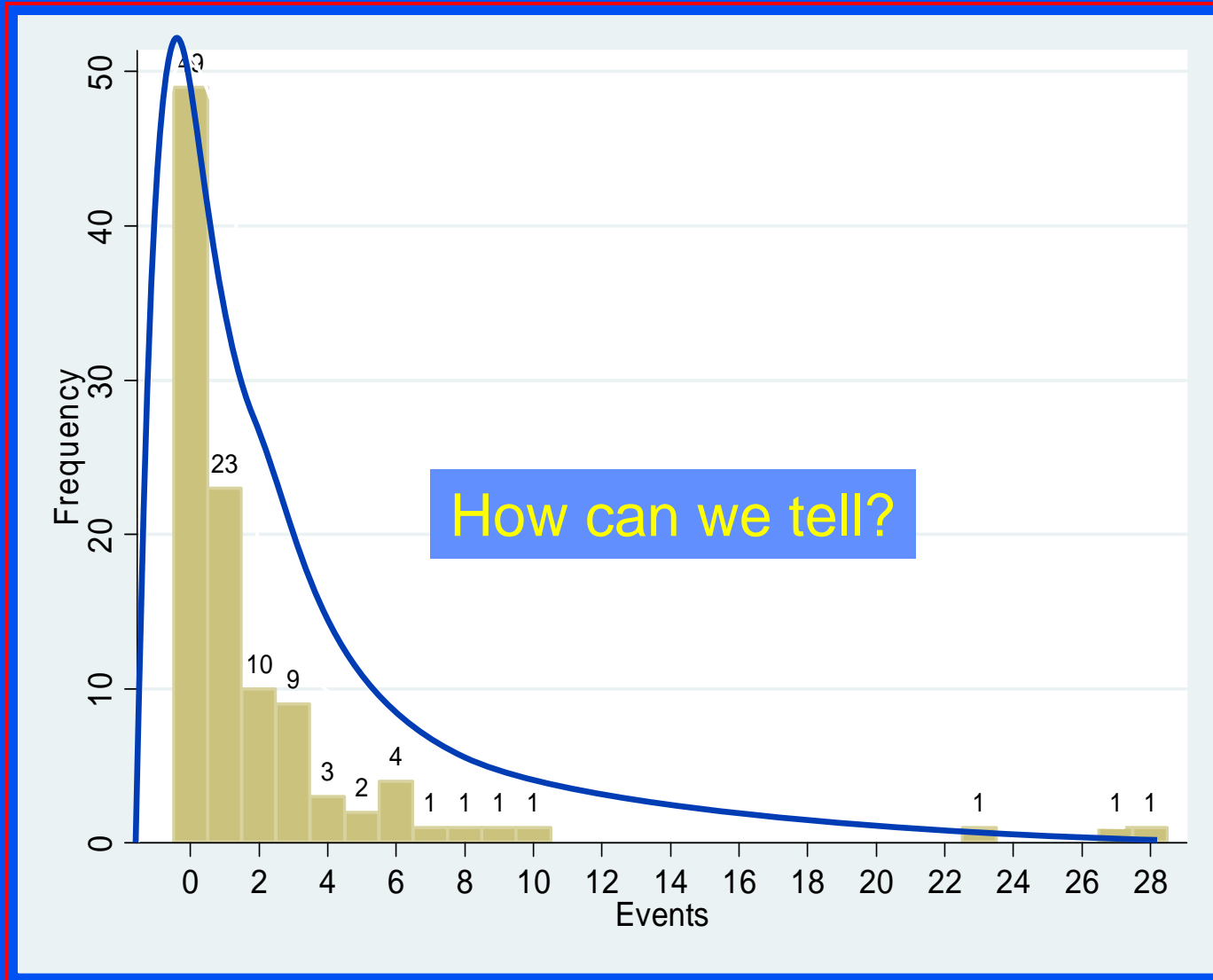


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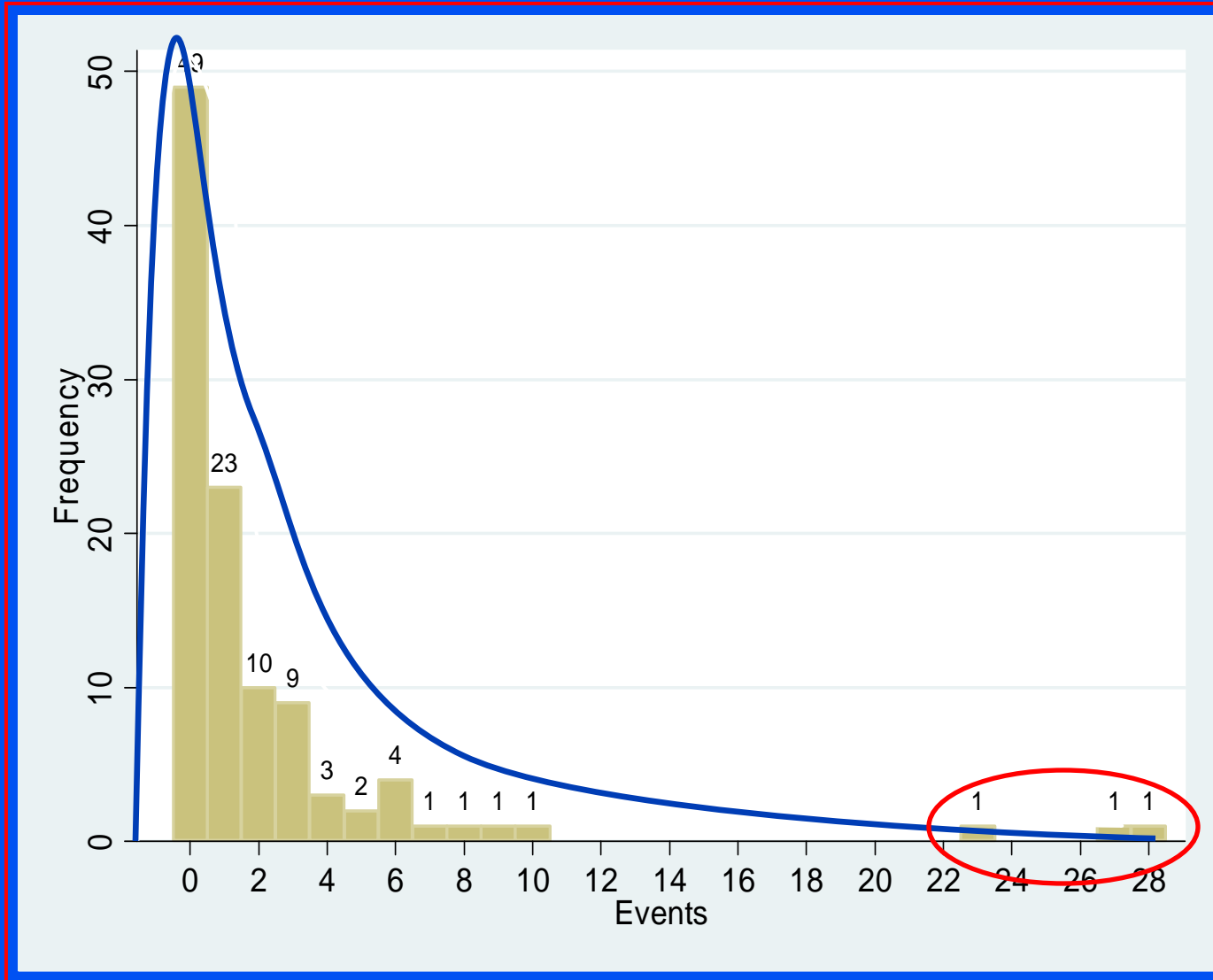


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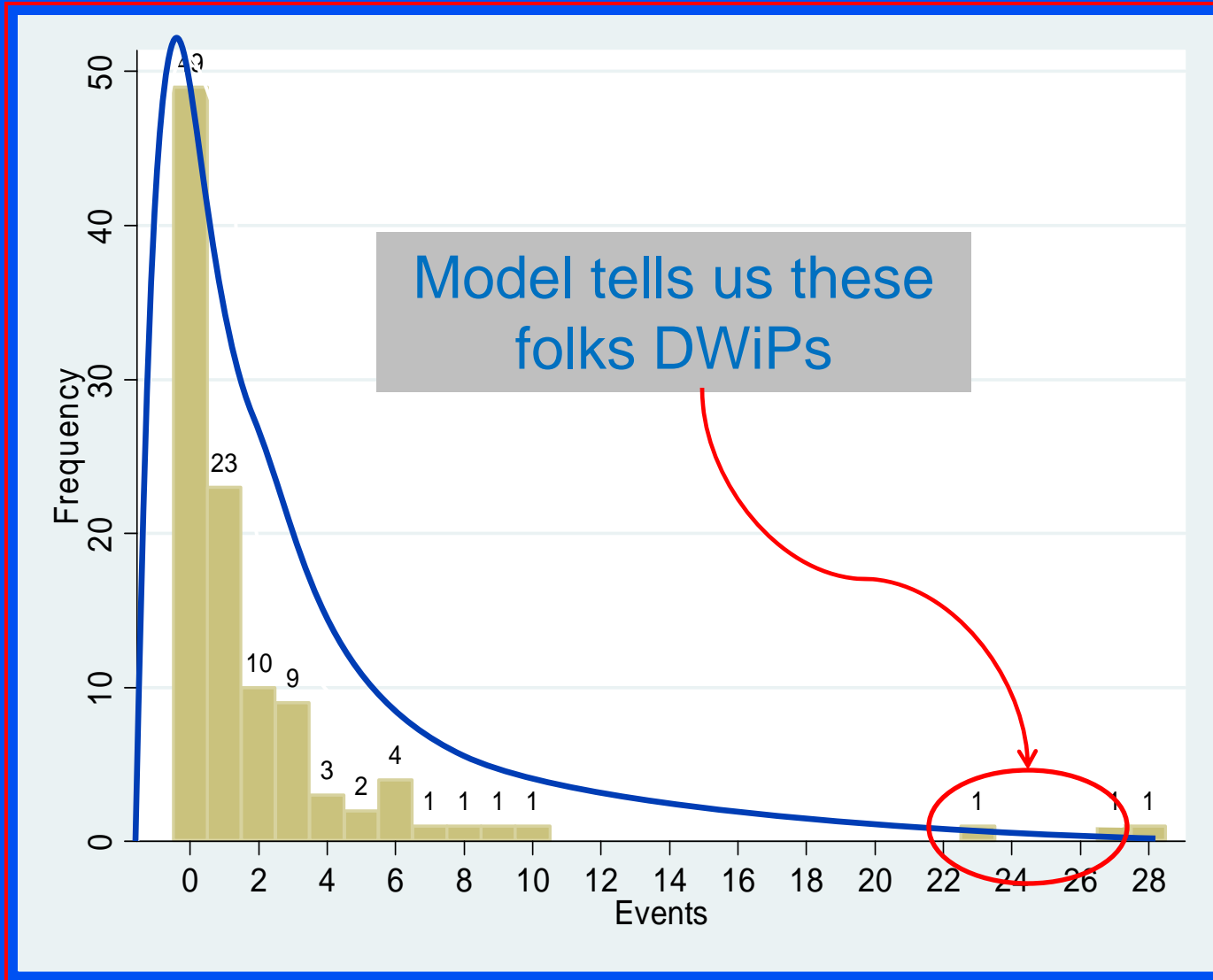


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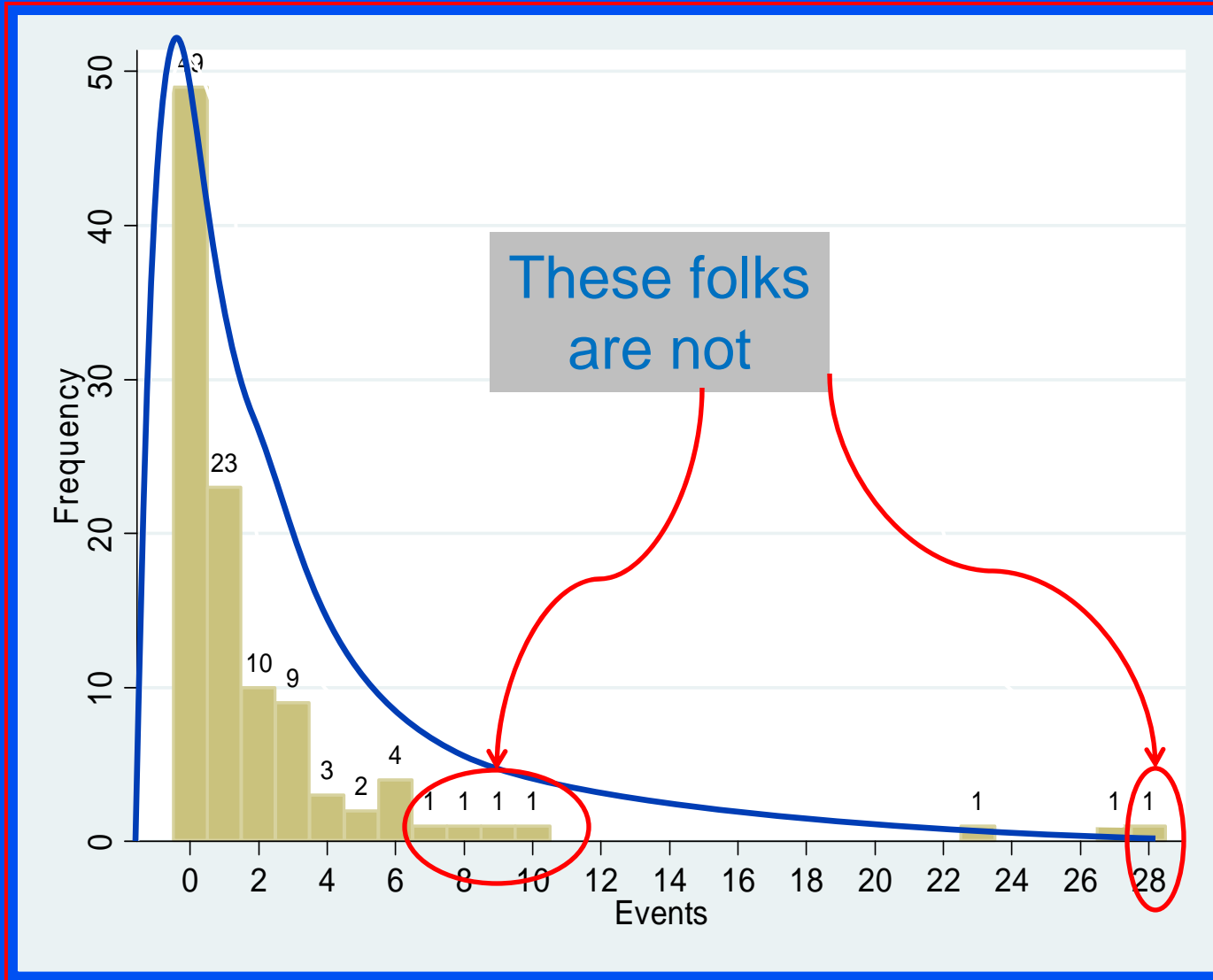


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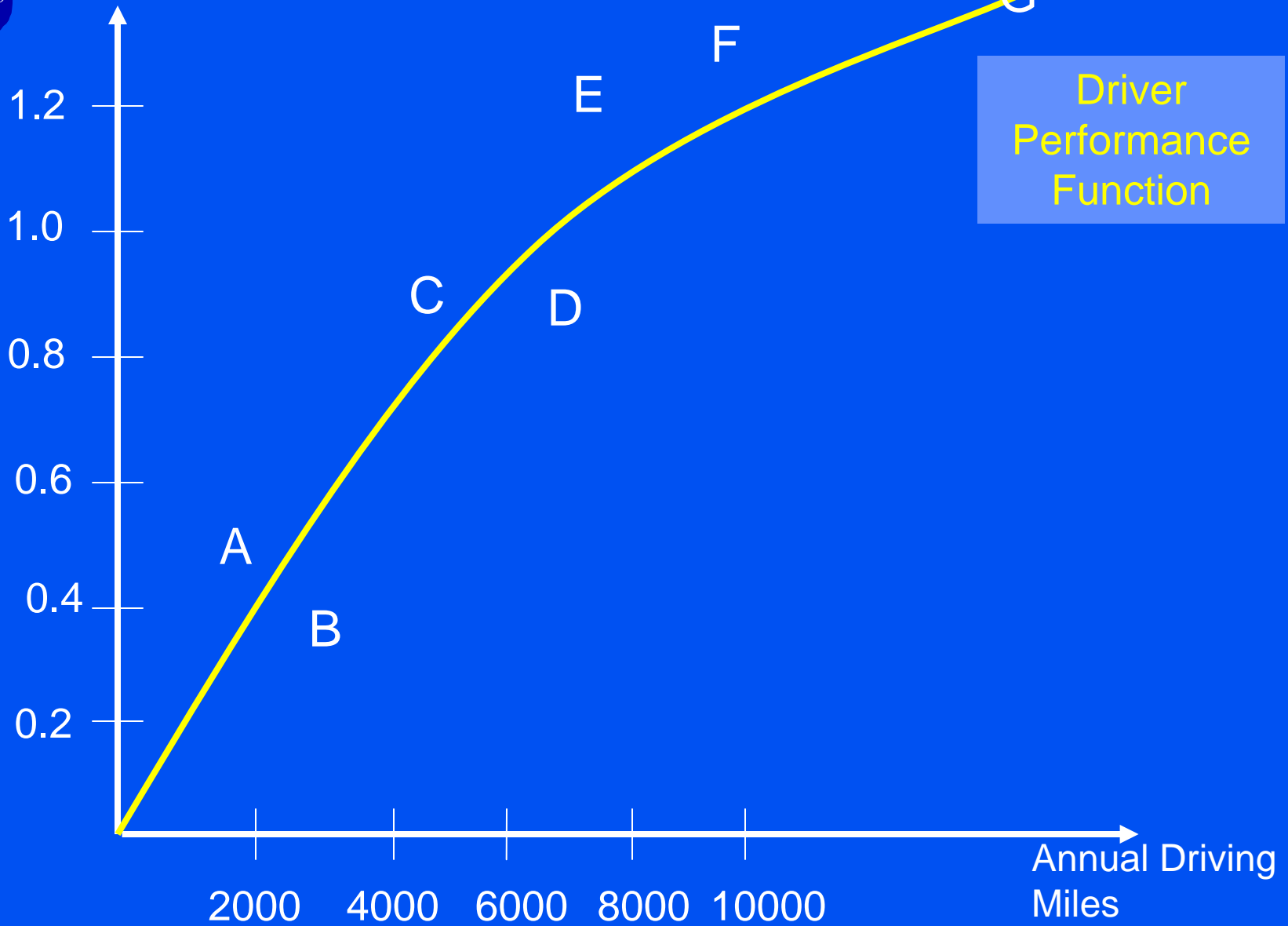
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DWiPs

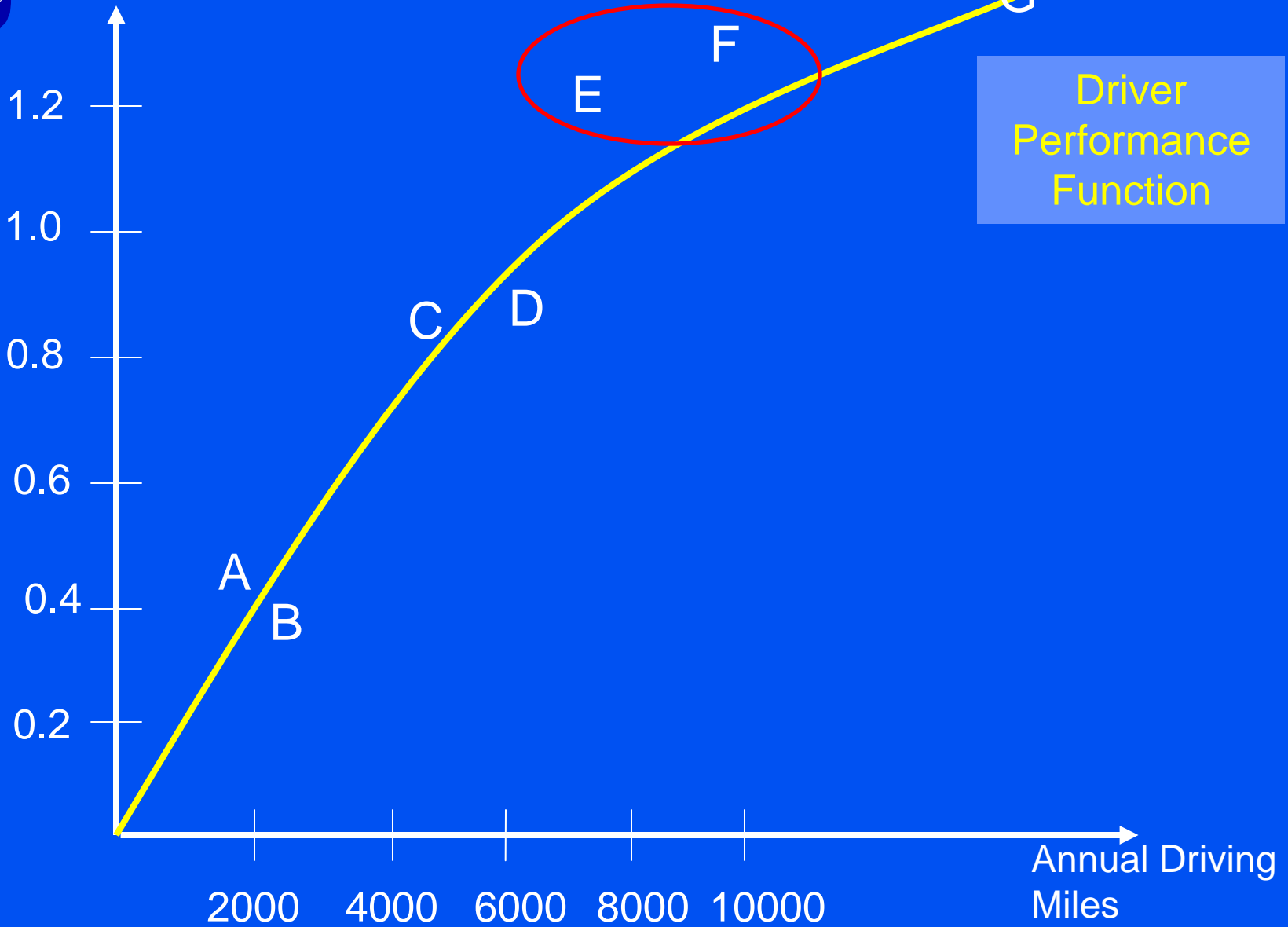
Events per unit time





DWiPs

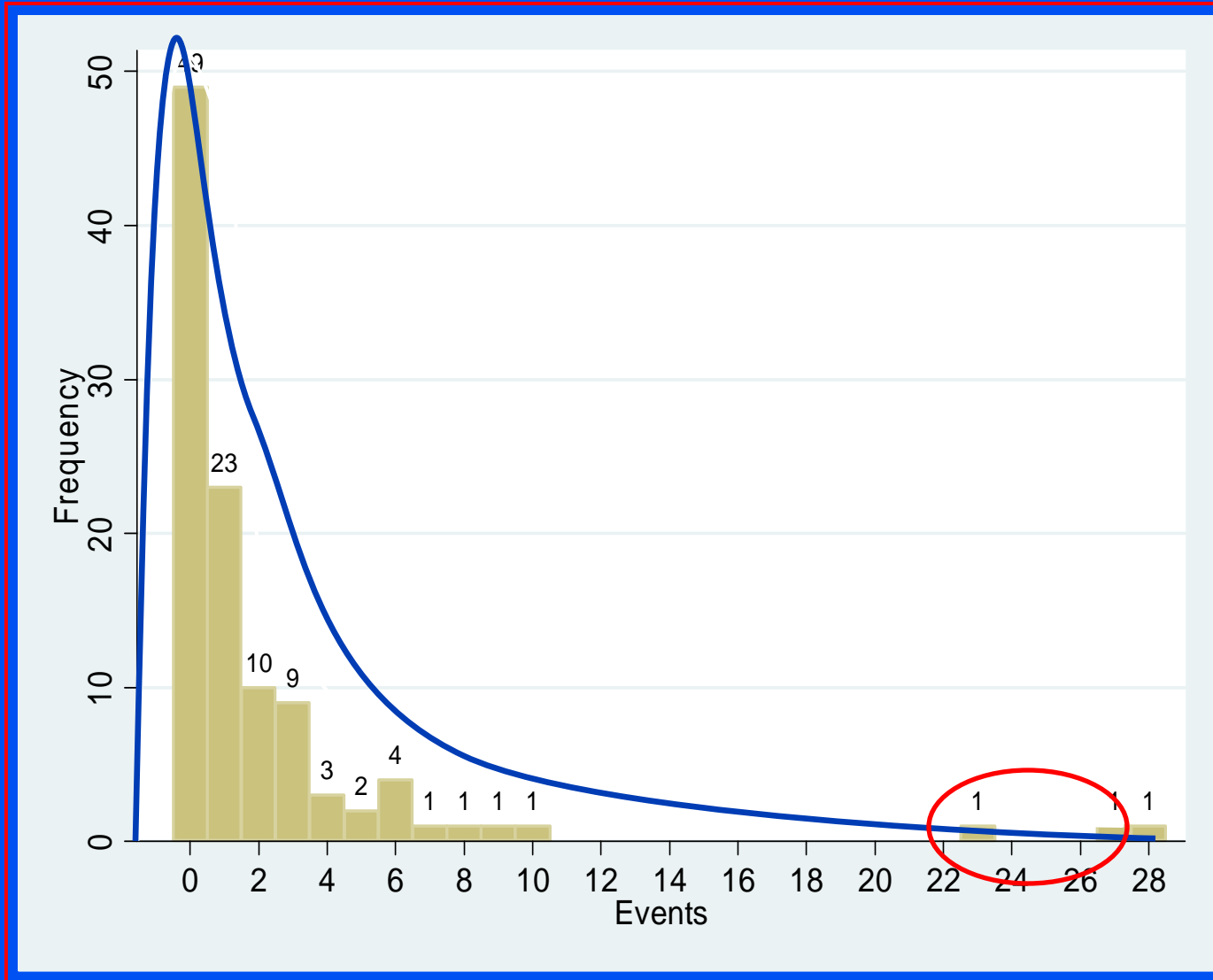
Events per unit time



Driver Performance Function



Events per Driver

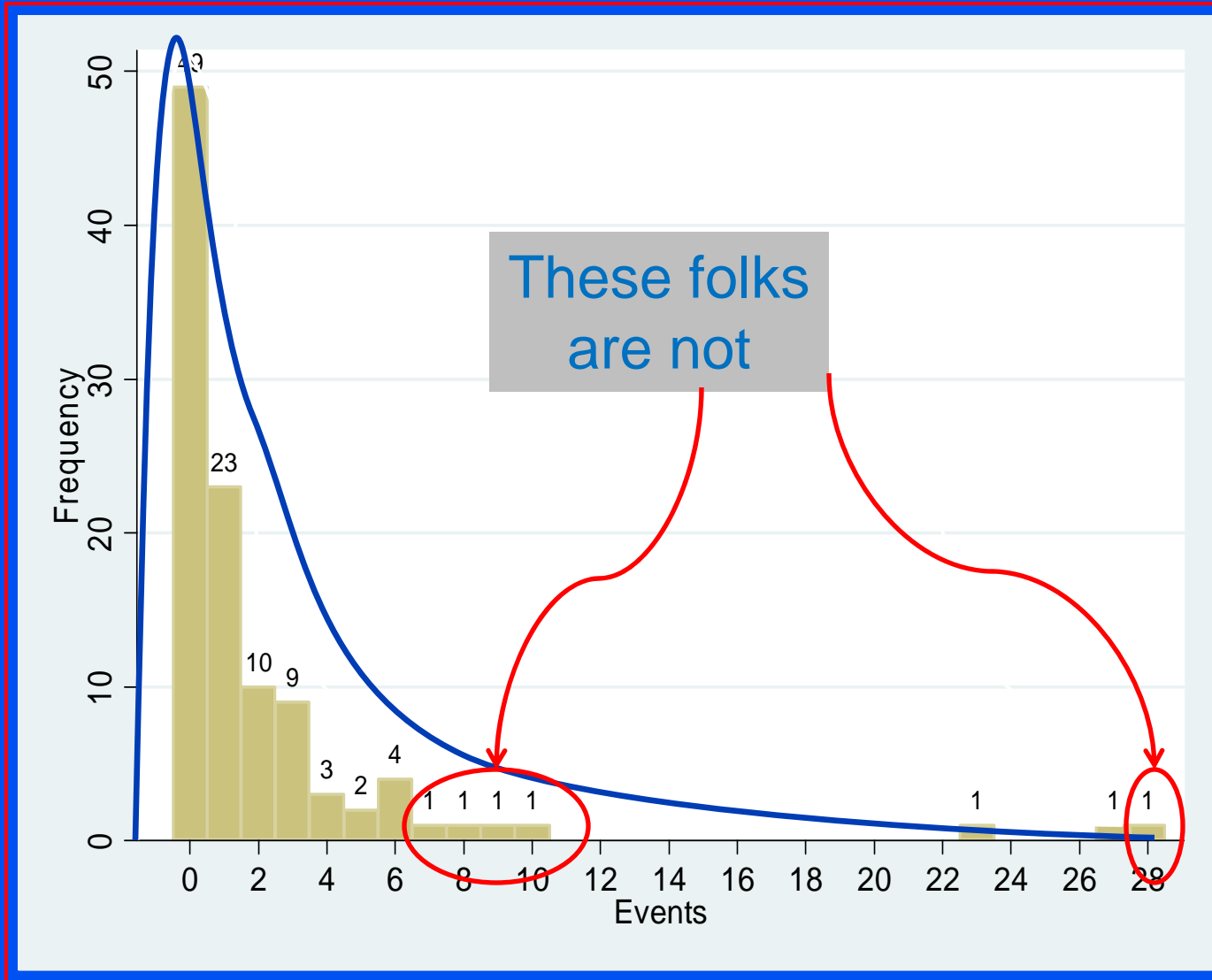


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Events per Driver



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Take Aways

- New methods not just for highways
- Can be applied to drivers, but with caution
- Choices are emerging to traditional approaches
- We want to help all of you be more effective with scarce dollars you have