



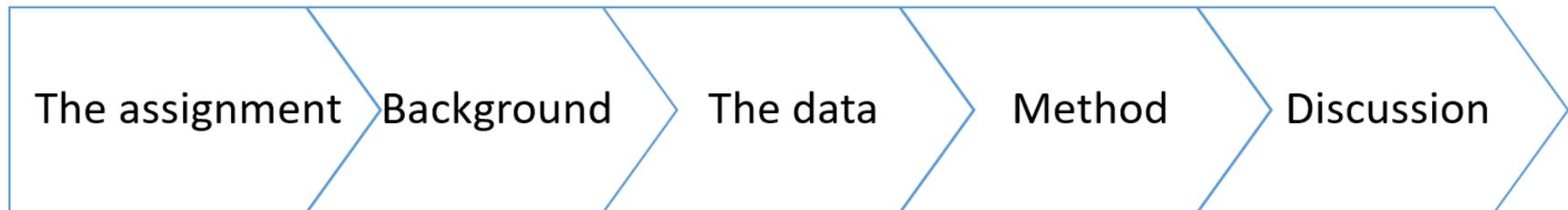
*"Working together to  
fund Washington's future"*

# Disabled Deduction Personal Income Tax Model

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Research & Fiscal Analysis

# Overview



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# The assignment

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# Calculation of WA personal income tax

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$$[\text{Taxable Income}] = \text{AGI} - \text{Deductions} - \text{Exemptions}$$

- **Deductions** = [Standard Deduction] + [Elderly Deduction] + **[Disabled Deduction]**
- **Exemptions** = 2,900 x [Count of filer, spouse, dependents]

$$\text{Tax} = [\text{Tax Rate}] \times [\text{Taxable Income}]$$

$$\text{Credits} = [\text{B\&O Credit}] + [\text{Out-of-State Credit}]$$

$$\text{Tax Due} = \text{Tax} - \text{Credits}$$

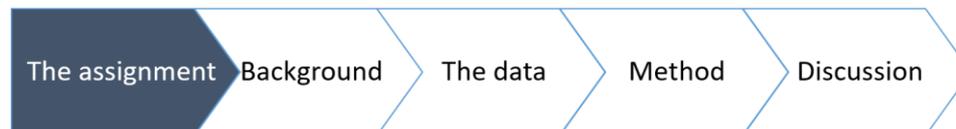
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# Deduction for disabled filers

<b>2002 Gates study<sup>1</sup></b>	Specified a \$1,000 deduction for disabled filers. Did not provide details.
<b>2003 bills<sup>2</sup></b>	Did not provide a disabled deduction.

We will use American Communities Survey information to estimate the deduction.



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# Background

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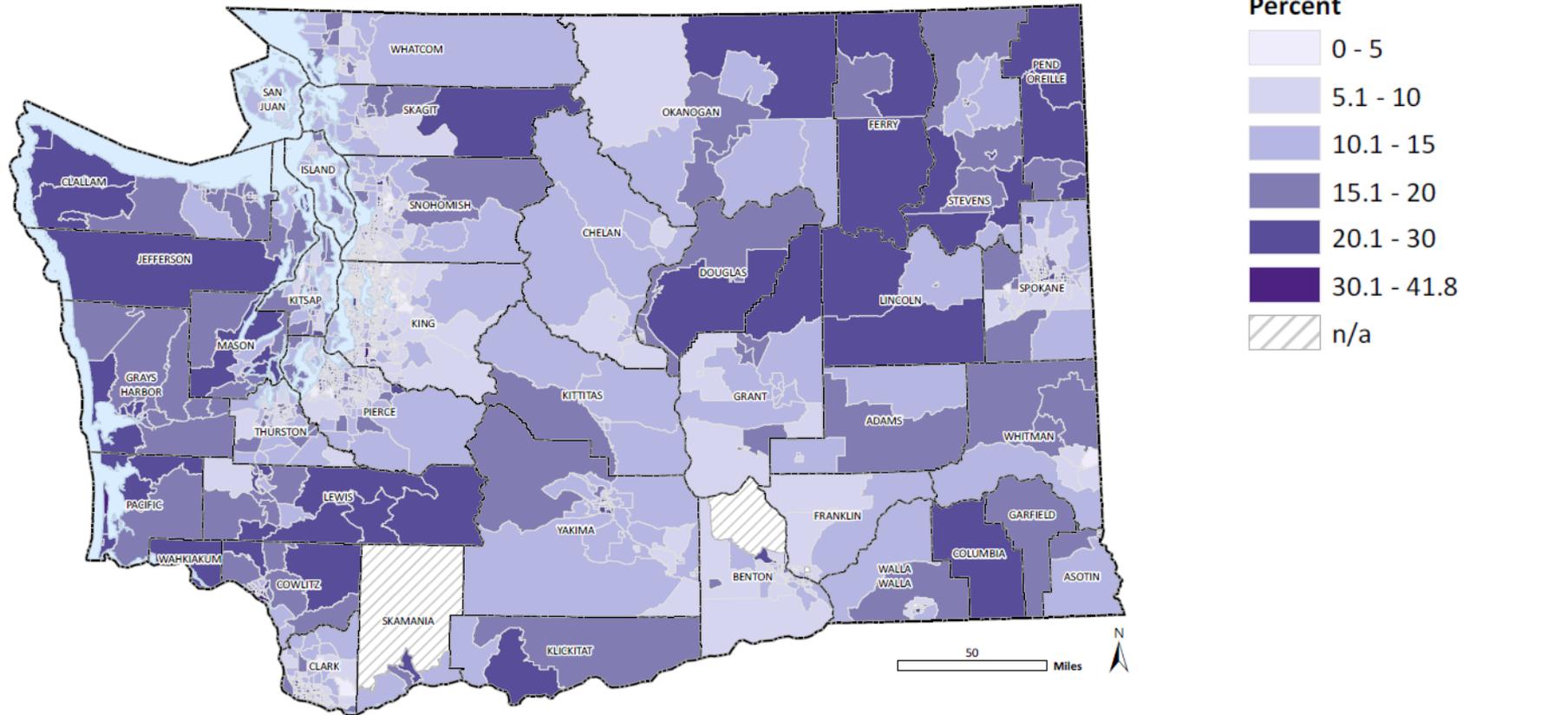
# The six disability questions in the American Community Survey.<sup>3</sup>

1. Is this person **deaf** or does he/she have serious **difficulty hearing**?
2. Is this person **blind** or does he/she have serious **difficulty seeing** even when wearing glasses?
3. Because of a physical, mental, or emotional condition, does this person have serious **difficulty concentrating, remembering, or making decisions**?
4. Does this person have serious **difficulty walking or climbing stairs**?
5. Does this person have **difficulty dressing or bathing**?
6. Because of a physical, mental, or emotional condition, does this person have **difficulty doing errands alone** such as visiting a doctor's office or shopping?



# Disability rates in Washington

Residents living in the community (2012)<sup>4</sup>



The assignment

Background

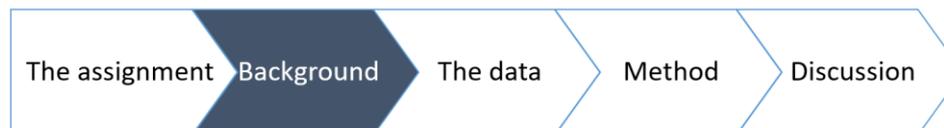
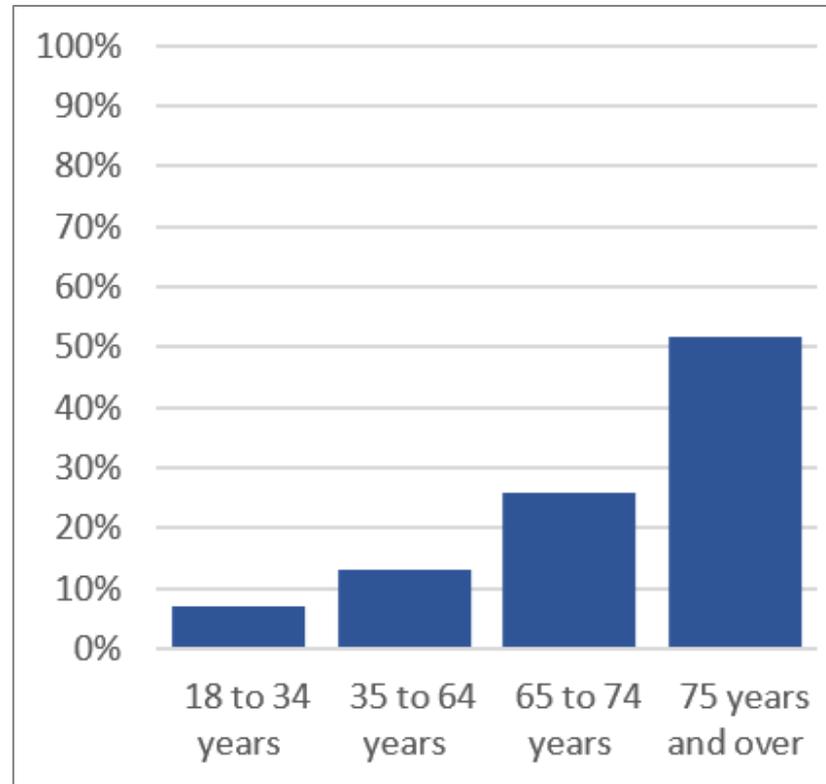
The data

Method

Discussion

# Disability rates by age

WA residents living in the community, 2013-2017<sup>5</sup>



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# The data

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# American Communities Survey

## US Census Bureau

### Reports on:

- Age
- Disability
- Income
- Many other things

### 5-year estimates (e.g. 2013-2017)

- Represent 5 percent of population
- Average of response over 5 years
- More precise than 1-year estimates

The American  
FactFinder  
provided  
prepared tables  
based on data  
from ACS and  
other surveys.



# IRS: Individual Income Tax Data

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## Returns dataset - for each filer and spouse lists:

- Birthdate
- Income and tax information

The IRS data does not report on disability status.



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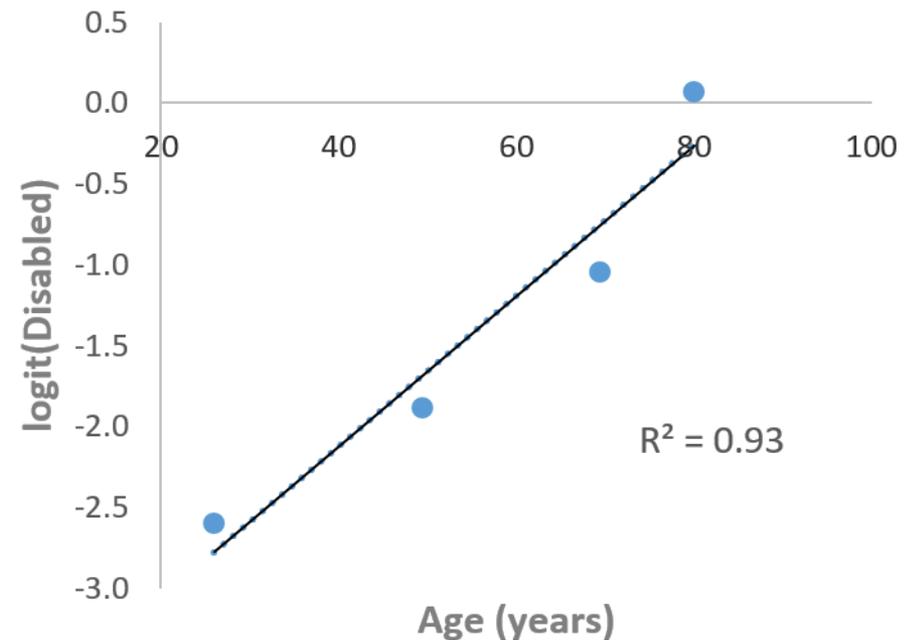
# Method

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# Model relationship between age and disability

The data provides evidence for a strong association between age and disability.

## Disability Status vs. Age



*Author's analysis of ACS data from American FactFinder [5].*

The assignment

Background

The data

Method

Discussion

## Estimate likelihood of disability for each age.

Example calculation of the probability of disability for a 45-year old WA resident.

Select model form.	$\text{logit}(\text{Disabled}) = \beta^0 + \beta^1 * \text{Age} + \varepsilon$
Use estimated coefficients.	$\text{logit}(\text{Disabled}) = -4.19 + 0.0502 * \text{Age}$
Substitute 45 as the age.	$\text{logit}(\text{Disabled}) = -4.19 + 0.0502 * 45 = -1.931$
Calculate the odds of disability.	$\text{odds}(\text{Disabled}) = e^{-1.931} = 0.145$
Convert odds to probability.	$p(\text{Disabled}) = \text{Odds}/(\text{Odds}+1) = 0.127$



# Assign disability status to each taxpayer

1. Assign random number to each taxpayer.
2. If random number is less than  $p(\text{Disabled})$ , assume the taxpayer is disabled.

id	Age	Random	$p(\text{Disabled})$	Disability
1	45	0.16	0.13	NO
2	45	0.73	0.13	NO
3	45	0.26	0.13	NO
4	45	0.57	0.13	NO
5	45	0.87	0.13	NO
6	45	0.22	0.13	NO
7	45	0.37	0.13	NO
8	45	0.63	0.13	NO
9	45	0.29	0.13	NO
10	45	0.12	0.13	YES



# References

1. Gates, W.H. (2002). *Tax alternatives for Washington State*. Washington State Tax Structure Study Committee. (<https://dor.wa.gov/about/statistics-reports/tax-structure-final-report>)
2. Washington State Legislature (2003). *SB 5056: Implementing tax reform*. (<https://app.leg.wa.gov/billsummary?BillNumber=5056&Year=2003&Initiative=false>)
3. U.S. Census Bureau (n.d.) *American Community Survey and Puerto Rico Community Survey 2018 subject definitions*. (<https://www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html>)
4. Washington Department of Social and Health Services (2014) *Percent with a disability by census tract, 2012*. ([https://www.dshs.wa.gov/sites/default/files/rda/reports/Map1\\_ACS2012\\_Percent\\_Disability\\_WA\\_Counties.pdf](https://www.dshs.wa.gov/sites/default/files/rda/reports/Map1_ACS2012_Percent_Disability_WA_Counties.pdf))
5. U.S. Census Bureau (n.d.) *American FactFinder: S1810 disability characteristics - 2013-2017 American Community Survey 5-Year estimates*.

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# Discussion

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# For more information...

## Model Review document



### Model Review: Disabled Deduction (Supplement to Personal Income Tax model)

<b>Date</b>	April 14, 2020
<b>Contact</b>	<b>Research and Fiscal Analysis Division (RFA)</b> Analyst: Sara del Moral; <a href="mailto:sarad@dor.wa.gov">sarad@dor.wa.gov</a> ; (360) 534-1525 Manager: Valerie Torres; <a href="mailto:valeriet@dor.wa.gov">valeriet@dor.wa.gov</a> ; (360) 534-1521
<b>Model Purpose</b>	For the personal income tax (PIT) model, assign an assumed disability status, which will allow us to estimate the disabled deduction
<b>Data Sources</b>	(1) IRS individual income tax data, TY2017 (2) American Community Survey (2013-2017), as summarized in the American <a href="#">FactFinder</a>
<b>Attachment</b>	U.S. Census Bureau (n.d.) American <a href="#">FactFinder</a> ; S1810 Disability Characteristics - 2013-2017 American Community Survey 5-Year Estimates.
<b>Requirements Model Used to Fulfill</b>	This is a supplemental analysis, to support development of a model for a personal income tax, as required under ESHB 1109 (2019), Sec. 137(B) (c)(vii).
<b>Questions for Technical Advisory Group</b>	We do not have specific questions, but welcome advice and suggestions.
<b>Questions from Technical Advisory Group</b>	

## Contact us:

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