Do Health Examination Completion Effects Hold up across Geographical Areas? Evidence from the National Health and Nutrition Examination Survey

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Disclaimer

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention

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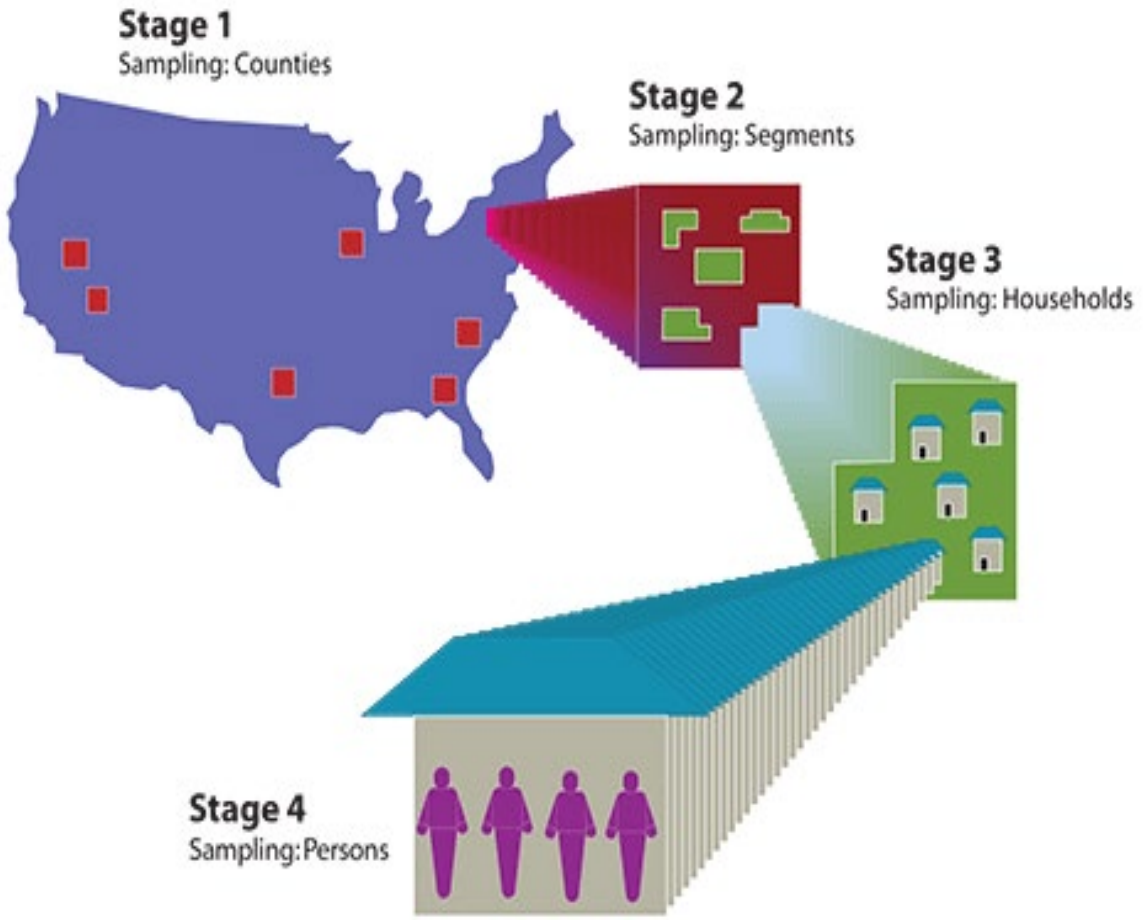
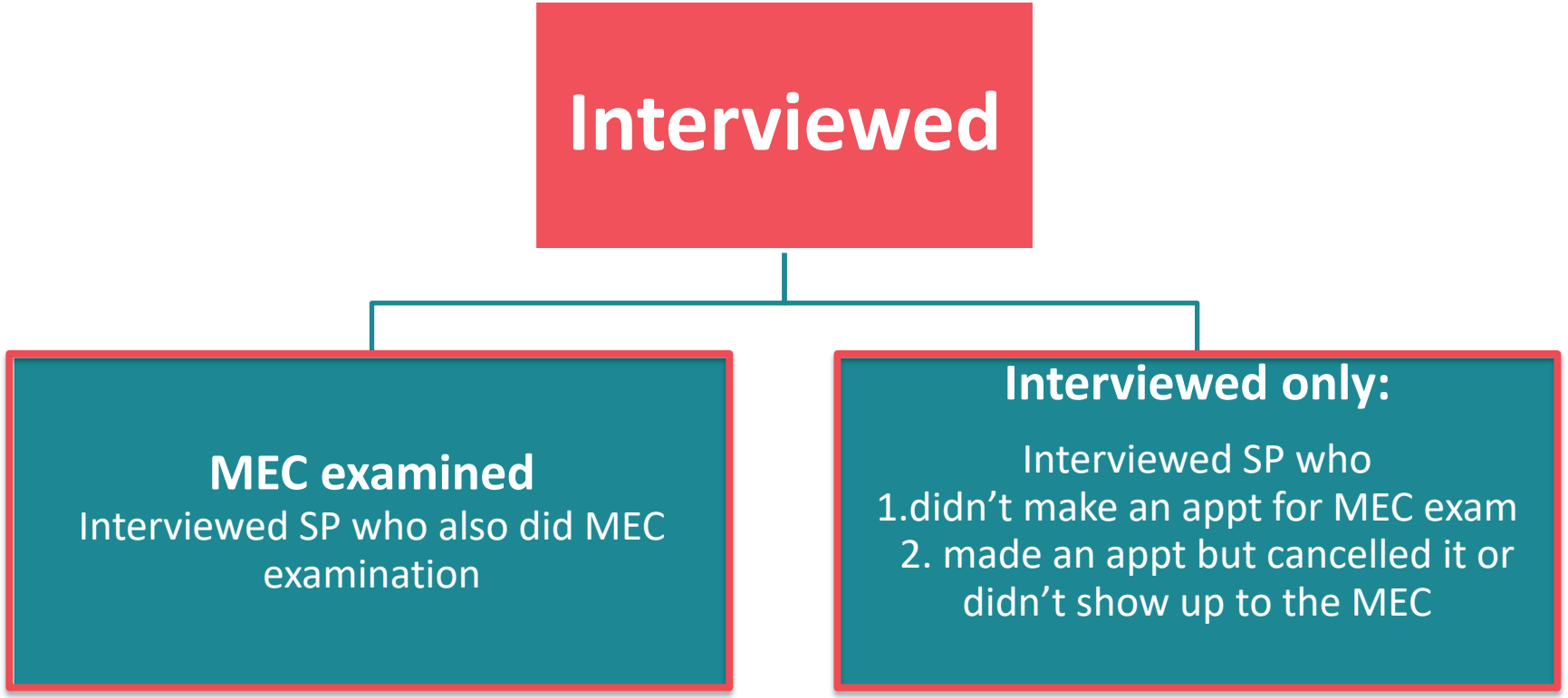
- Complex multistage probability sample design
- Selected households are screened to identify eligible participants
- Selected participants are interviewed and invited to a health exam at a Mobile Examination Center (MEC)
- MEC incentive amount differs by age group



MEC Examination Status and Stage Response Rate



$$\text{MEC RR} = \frac{\#\ of\ MEC\ examined\ SPs}{\#\ of\ Interviewed\ SPs}$$

Overall Incentive Effect (reported last year)

- Average MEC response rate dropped to ~70% during the start of the August 2021 – August 2023 cycle
  - MEC incentive for respondents age 16+ increased from $85 to $125 in the middle the cycle
  - Incentive increase to $125 increased response rate by 7%-points
  - Slightly narrower range across PSUs

Research Questions

- RQ #1 - Does the overall positive effect of incentives hold when controlling for PSU-level and person-level characteristics?
- RQ #2 - What impact does the increased incentive have on reducing demographic subgroup response rate variation?
- RQ #3 - Does the higher incentive affect households with/without minors differently?

RQ #1 - Controlling for Person and PSU Characteristics

- Logistic regression models predicting MEC examined from incentive level and other variables
  - Main independent variable: Incentive level
  - Person-level (fixed effect): Gender, race, age, HH size, interview mode, diabetic, general health, health insurance
  - PSU-level (random effect): Census region, state health grouping, MEC season, urban/rural

RQ #1 - Incentive Effect Remains When Controlling for PSU and Person Characteristics

Fixed Effects	Random (characteristics of PSUs)	OR for Incentive	LCL (95%)	UCL (95%)
Incentive only		1.44	1.28	1.63
Incentive	Census region, Health state, MEC season, Urban-rural	1.38	1.18	1.61
Incentive, gender, race, age group		1.45	1.28	1.64
Incentive, gender, race, age group	Census region, Health state, MEC season, Urban-rural	1.38	1.20	1.60
Incentive, Gender, race, age group, HH size, interview mode, diagnosed diabetes (Y/N), general health, health insurance		1.42	1.25	1.61
Incentive, Gender, race, age group, HH size, interview mode, diagnosed diabetes (Y/N), general health, health insurance	**Census region, Health state, MEC season, Urban-rural**	**1.37**	1.18	1.58

SAS 9.4 GLIMMIX Procedure

RQ #2 - MEC Response Rate Differences Across Groups

- Assessed variability in response rate (RR variance) across demographic variables
  - Vars included demographics, health, and methods
    - Race/ethnicity, gender age, HH size, interpreter used, interview language, has health insurance, general health, interview mode, diagnosed diabetes

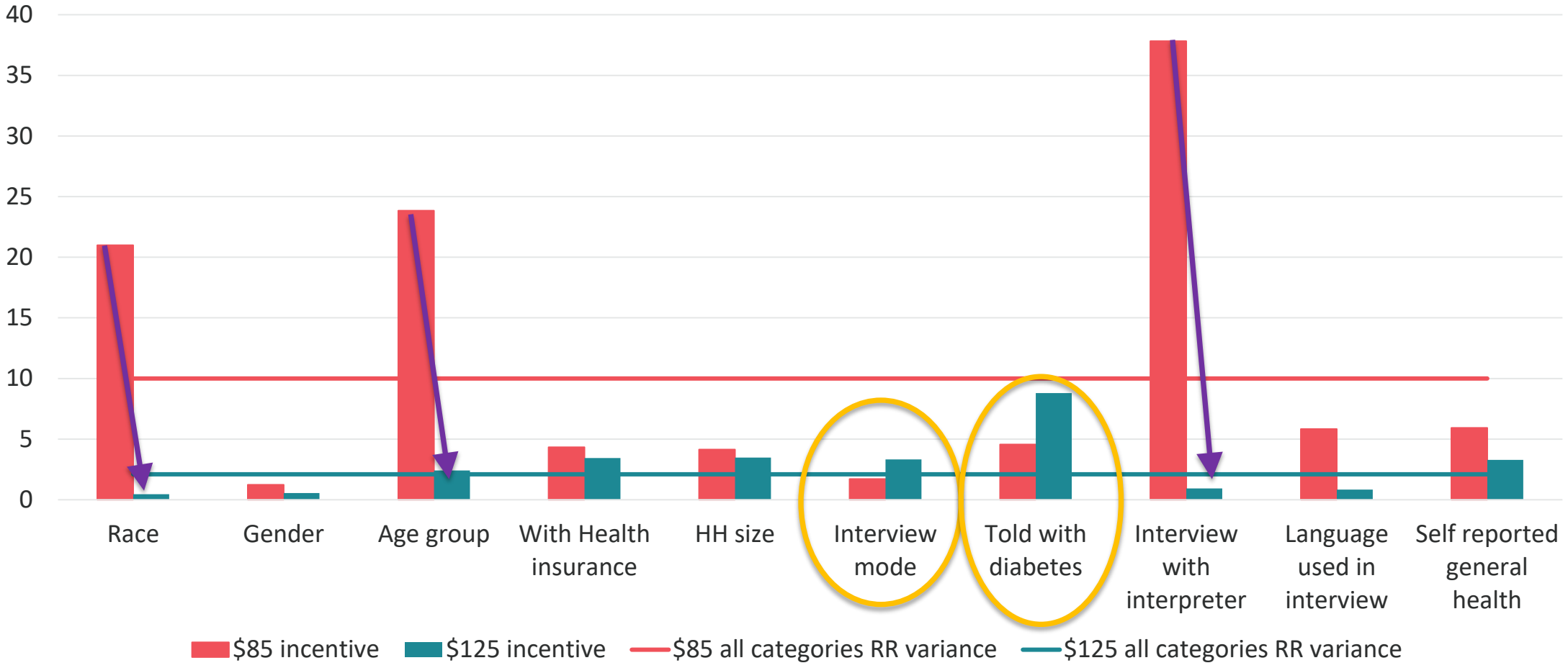
MEC Response Rate Variance Calculation

		Examined Rate		RR variance	
		$85	$125	$85	$125
Race	NH White	73.8	79.2	21.0	0.5
	NH Black	68.2	79.4		
	Hispanic	75.8	78.3		
	NH Others	66.0	80.0		

Average RR over the race groups = $\frac{(73.8+68.2+75.8+66.0)}{4} = 71.0$

Variance of RR = $\frac{(73.8-71.0)^2+(68.2-71.0)^2+(75.8-71.0)^2+(66.0-71.0)^2}{3} = 21$

RQ #2 - $125 Incentive Reduces MEC Response Rate Variance



RQ #3: Difference in Incentive Effect ($125-$85) Among Households With and Without Interviewed Minors

- Compare difference in RR between those household types
- Overall and by other demographic and health characteristics
- Two-by-two factorial design ANOVA tests
  - Main effects: incentive and with/without minor
  - **Interaction effect**

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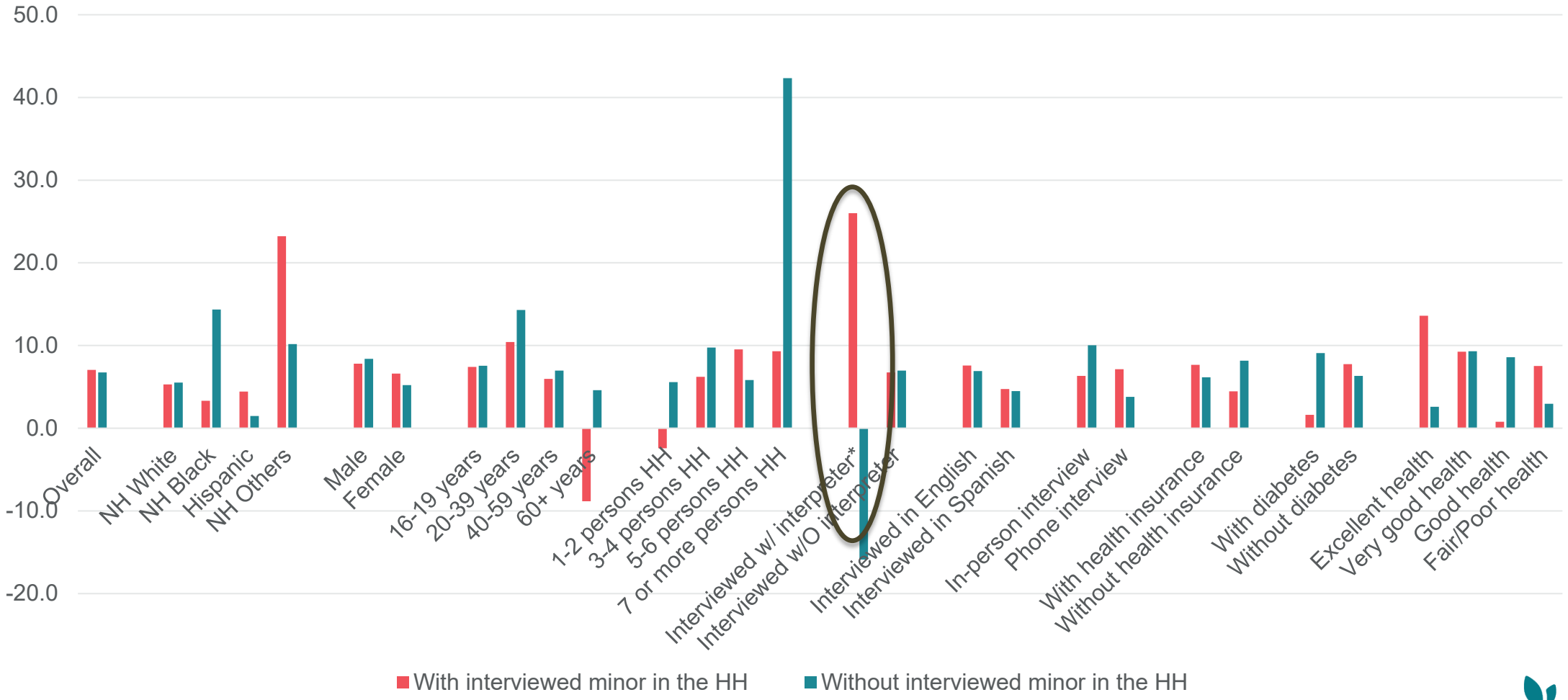
RQ #3: Difference ($125-$85) RR by with or without interviewed minors



Summary

- Incentive effect remains when controlling for person-level and PSU characteristics
- Higher incentive usually reduces variability in response rates across demographic group
- Overall, effect of the higher incentive didn't vary by whether there was a minor SP in the household
  - Interacted with whether an interpreter was used
  - Possible language or cultural influences

Next Steps and Questions for Audience

- Refine effect estimation methods
  - We welcome recommendations on causal modeling approaches
- Deeper exploration of larger effects
  - HH Minor SPs MEC RR
  - Refusal reasons for SPs who were not examined
- Assess effect on components of MEC participation
  - Scheduling, rescheduling, component completion rates

Thank you!

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RR and RR variation by demographics

		Examined Rate		RR variance	
		$85	$125	$85	$125
Race	NH White	73.8	79.2	21.0	0.5
	NH Black	68.2	79.4		
	Hispanic	75.8	78.3		
	NH Others	66.0	80.0		
Gender	Male	71.5	79.8	1.2	0.6
	Female	73.1	78.7		
Age group	16-19 years	73.8	81.0	23.8	2.4
	20-39 years	64.9	77.3		
	40-59 years	72.6	79.4		
	60+ years	76.2	79.9		
Household sizes	1-2 persons	73.7	79.1	4.1	3.5
	3-4 persons	70.9	79.0		
	5-6 persons	70.5	79.3		
	7 or more persons	68.8	82.9		

RR and RR variation by interview operation

		Examined Rate		RR variance	
		$85	$125	$85	$125
Interpreter used	Yes	81.0	80.5	37.8	0.9
	No	72.3	79.2		
Language used in interview	English	72.0	79.1	5.8	0.8
	Spanish	75.4	80.4		
Interview Mode	In-person	71.2	80.4	1.7	3.3
	Phone	73.1	77.8		

RR and RR variation by health status

		Examined Rate		RR variance	
		$85	$125	$85	$125
Insurance status	With insurance	73.0	79.6	4.3	3.4
	Without insurance	70.1	77.0		
Diagnosed diabetes	Yes	75.0	82.9	4.6	8.8
	No, including border	72.0	78.7		
Self reported general health	Excellent	69.5	76.4	5.9	3.3
	Very good	70.4	79.7		
	Good	74.0	80.5		
	Fair/Poor	74.3	78.1		
Overall		72.4	79.2	10.0	2.1

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