

# Open Policy Analysis: Principles and Applications

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EDI  
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- 1 Why we need Open Policy Analysis (Hoces de la Guardia, Grant & Miguel, 2018)
- 2 Application to policy estimates of the minimum wage.

# Policy Analysis And The Evidence-Based Policy Movement

Evidence-Based movement is growing.

- “The golden age of evidence-based policy” (Haskins 2017).
- Credible causal evidence (Angrist & Pischke, 2010)
- Transparency and reproducibility of research (Miguel et al. 2014).
- Commission on Evidence-Based Policymaking (CEBP, 2017)

Policy Analysis is a fundamental link.

- As many definitions as textbooks (Dunn, 2015; Weimer & Vining, 2017; Williams, 1971)
- Common denominator: client-oriented empirical analysis meant to inform a specific policy debate
- Aspires at scientific rigor. (Wildavsky 1979),

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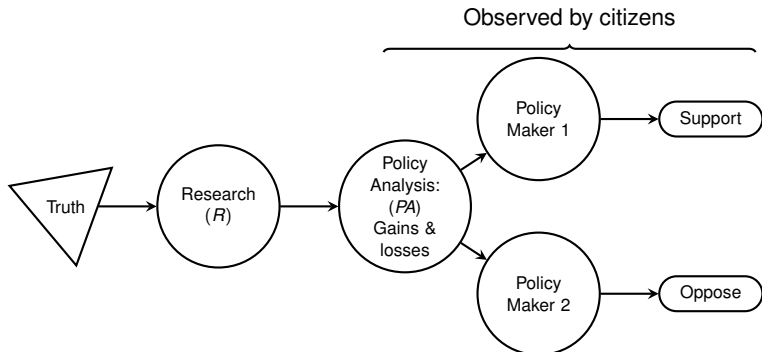
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# Examples of Policy Analysts



# One Ideal Evidence-Based Policy Link



# Reproducibility Crisis In Empirical Research

- Large magnitude of publication bias (Franco et al 2014).
- Evidence of extensive p-hacking across social science disciplines (Gerber et al 2008, Brodeur et al 2016).
- Replication rates are low (Collaboration et al, 2015 , Camerer et al, 2016).
- Computational reproducibility is also low (Stodden et al 2016, Chang and Li 2015, Gertler et al 2018).

# The Open Science Movement

- Definition of principles of Open Science/Research Transparency (Miguel et al 2014)
- Development of guidelines to operationalize principles of Open Science (Nosek et al 2015)
- Journals and funders: Journals (Science + 5k other journals), Registries (AEA), Funders (NIH, NSF and multiple donors)



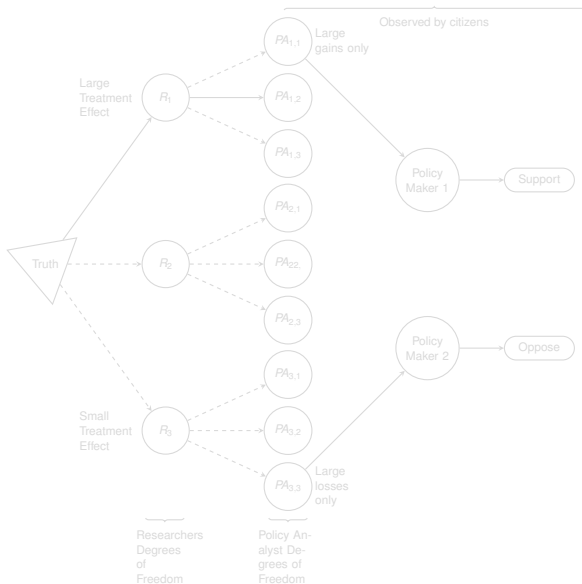
# Credibility Crisis Of Policy Analysis

- Incredible Certitudes (Manski, 2013)
- Report wars (Wesselink et al, 2013)
- Alternative facts (“The Death of Expertise” Nichols, 2017; “The Death of Truth”, Kakutani 2018; “Truth Decay”, Rich & Kavanagh 2018)

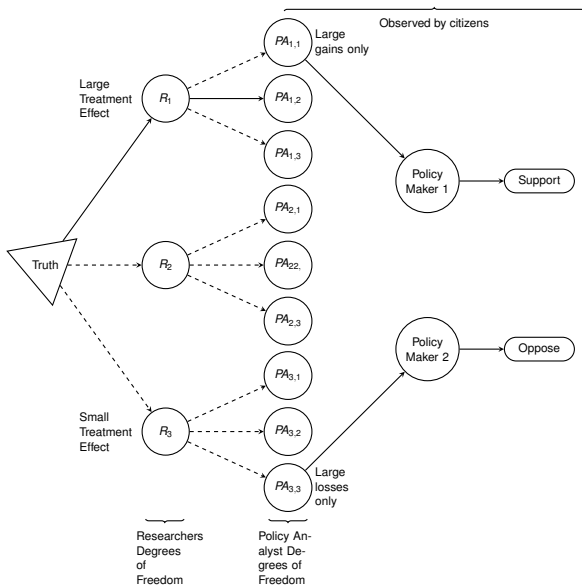
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# How This Affects The Evidence Based Policy Link?



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# Relevance

Main consequences of policy analysis that lacks openness:

- 1 Cherry picking evidence.
- 2 Challenging to automate and improve systematically recurring reports.
- 3 Difficulty understanding how research informs policy analysis.

# Cherry Picking Evidence

“When I was director of the CBO, I was very frustrated when we would write a policy report [saying] a certain policy would have these two advantages and these two disadvantages, and the advocates would quote only the part about the advantages, and the opponents would quote only the part about the disadvantages. That encourages the view that there are simple answers. There aren’t generally simple answers. There are trade-offs.”

— Douglas Elmendorf (Director of CBO, 2009-2015)  
Harvard Magazine, 2016

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# Open Science

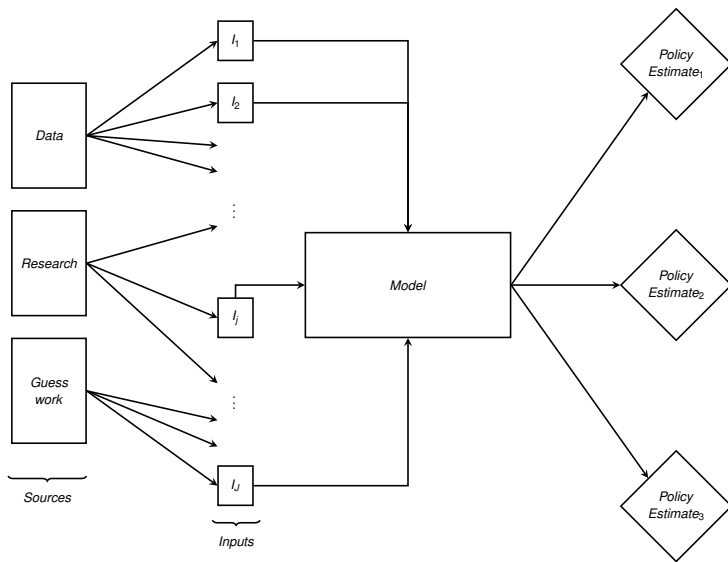
	Empirical Research	Policy Analysis
Problems	Reproducibility Crisis	Credibility Crisis
Solutions	<i>Open Science</i> Principles, Guidelines, Applications	



# Open Policy Analysis

	Empirical Research	Policy Analysis
Problems	Reproducibility Crisis	Credibility Crisis
Solutions	<i>Open Science</i> Principles, Guidelines, Applications	<i>Open Policy Analysis</i> Principles

# The Process of Policy Analysis



# Principles for Open Policy Analysis

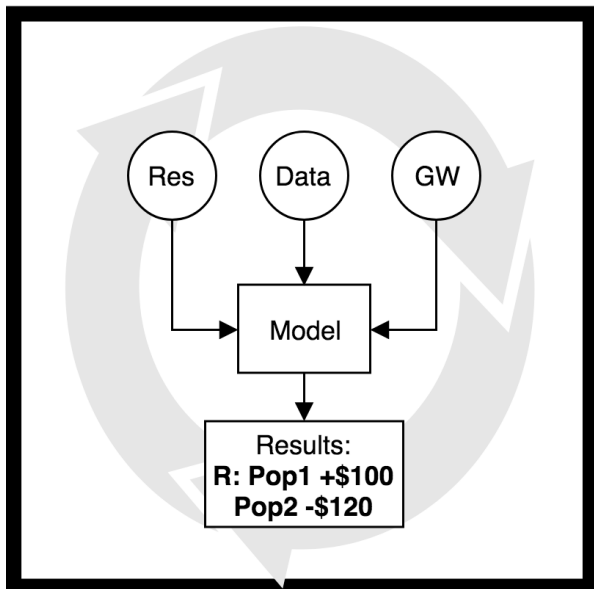
Proposed principles:

- 1 Computational Reproducibility
- 2 Analytic Transparency
- 3 Output Transparency

# Principle 1: Stop re-inventing the wheel

## Computational Reproducibility

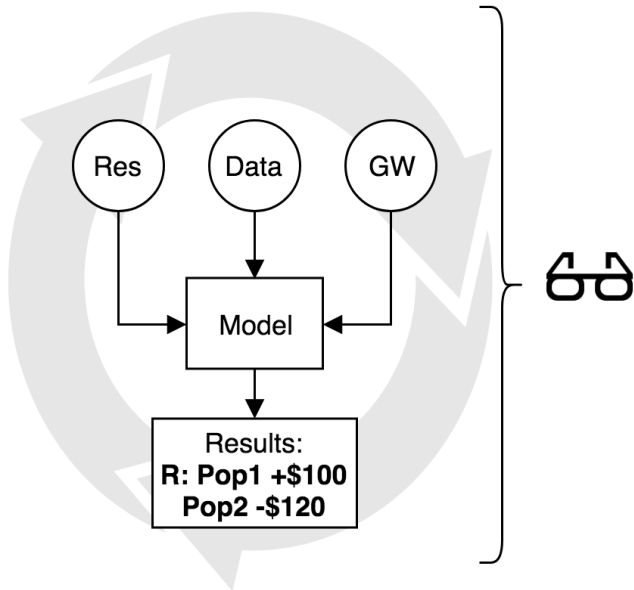
- Literate Programming
- Version control
- File structure
- **Label sources**



## Principle 2: Show your work (readable)

### Analytic Transparency

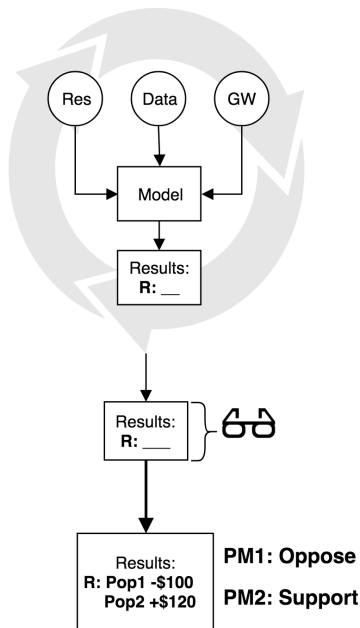
- Open code
- Open data
- Report as Dynamic Document



# Principle 3: Let's all agree on one table/viz

## Output Transparency

- Pre-committed output display
- Assumptions-output link

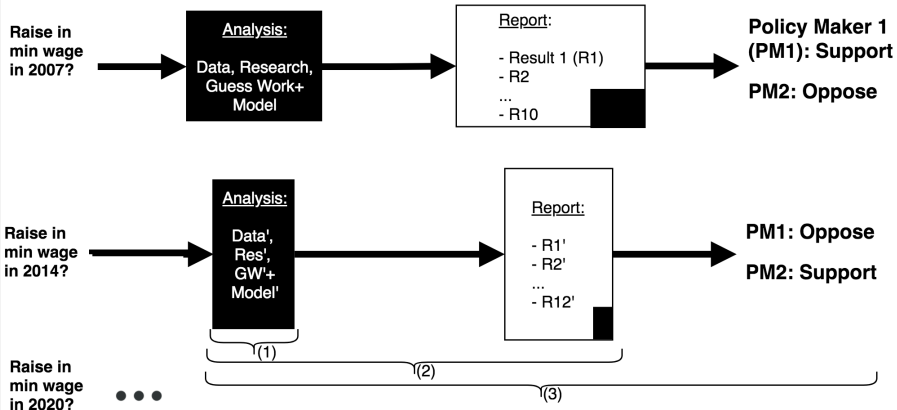


# Summing Up: Where We Are

## Traditional Policy

### Analysis

A



# Summing Up: Where Should We Go

## Open Policy Analysis

- Raise in min wage in 2007?
- 2014 (changes in + -)
- 2020, 2030, ...

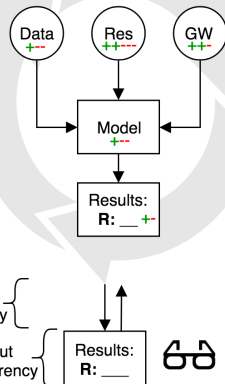
Results:  
R: Pop1 -\$100  
Pop2 +\$120

**PM1: Oppose**  
**PM2: Support**

Computational  
Reproducibility

Analytic  
Transparency

Output  
Transparency



B



- 1 Why we need Open Policy Analysis (Hoces de la Guardia, Grant & Miguel, 2018)
- 2 **Application to policy estimates of the minimum wage.**

# Description of Case Study

“The Effects of a Minimum-Wage Increase on Employment and Family Income” Congressional Budget Office (2014)

**Description:** CBO estimated the effects of a raise in the federal minimum wage from \$7.25/hr to \$10.10/hr.

**Main policy estimates:**

- 500,000 jobs would be lost.
- 16.5 million workers would receive a salary increase.
- Distributional effects: below poverty line (PL) +\$5billion; between one and three PL +\$12billion; between three and six PL +\$2billion; above six PL -\$17billion

**Key research estimate:** Elasticity of labor demand for teenagers in the labor force.

# Adapting TOP Guidelines to Policy Analysis

## Eight Standards at Three Levels

	Level 0	Level I	Level II	Level III
<b>Citation Standards</b>	Journal encourages citation of data, code, and materials, or says nothing	Journal describes citation of data in guidelines to authors with clear rules and examples.	Article provides appropriate citation for data and materials used consistent with journal's author guidelines	Article is not published until providing appropriate citation for data and materials following journal's author guidelines.
<b>Data Transparency</b>	Journal encourages data sharing, or says nothing	Article states whether data are available, and, if so, where to access them.	Data must be posted to a trusted repository. Exceptions must be identified at article submission.	Data must be posted to a trusted repository, and reported analyses will be reproduced independently prior to publication.
<b>Analytic Methods (Code) Transparency</b>	Journal encourages code sharing, or says nothing	Article states whether code is available, and, if so, where to access it.	Code must be posted to a trusted repository. Exceptions must be identified at article submission.	Code must be posted to a trusted repository, and reported analyses will be reproduced independently prior to publication.
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<b>Design and</b>	Journal	Journal articulates	Journal requires adherence to	Journal requires and enforces

Figure: Screen shot of TOP Guidelines

# Applying Guidelines to Build an Open Report

DEMO

# Sensitivity Analysis: Status Quo

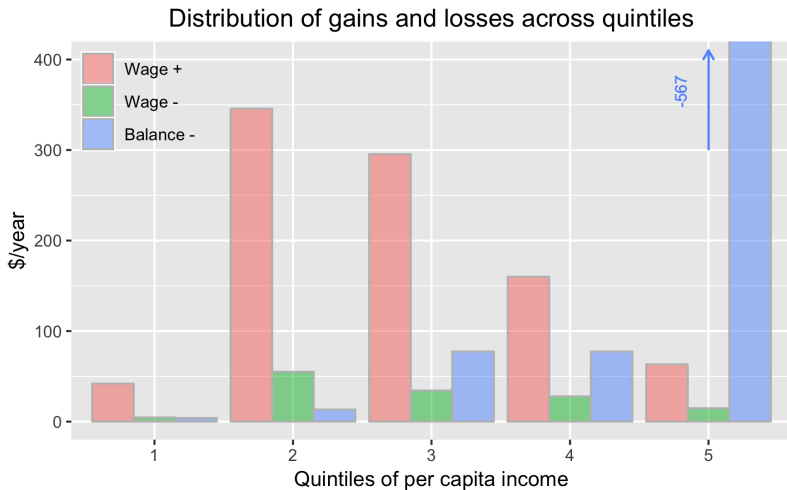


Figure: Default settings

# SA: Change in Elasticity of Labor Demand

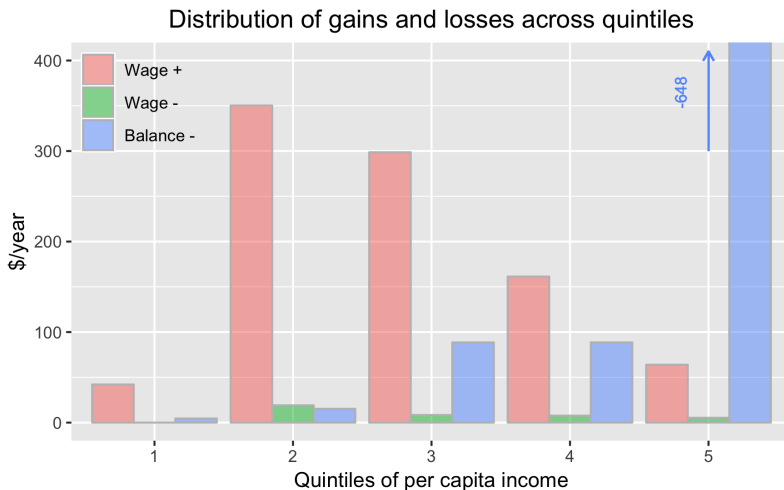


Figure: From  $\eta_{lit}^{teens} = -0.1$  to  $\eta_{lit}^{teens} = -0.01$  ( $\Delta -90\%$ )

# Sensitivity Analysis: Status Quo

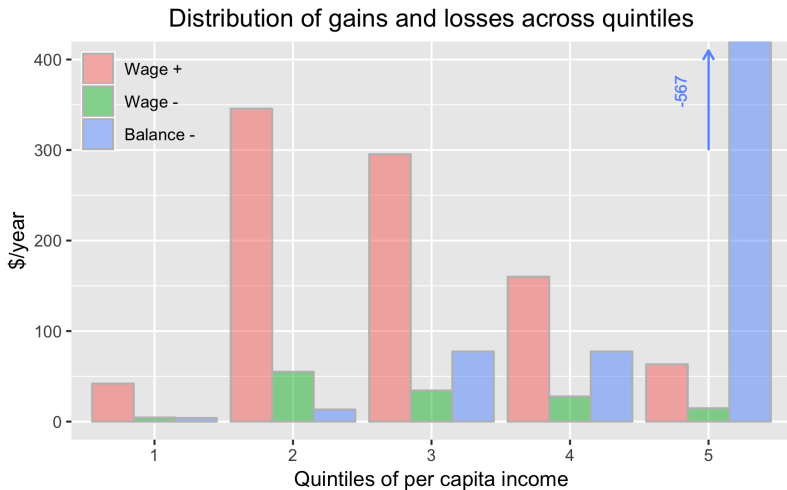


Figure: Default settings

# SA: Change in Distribution of Balance Loses

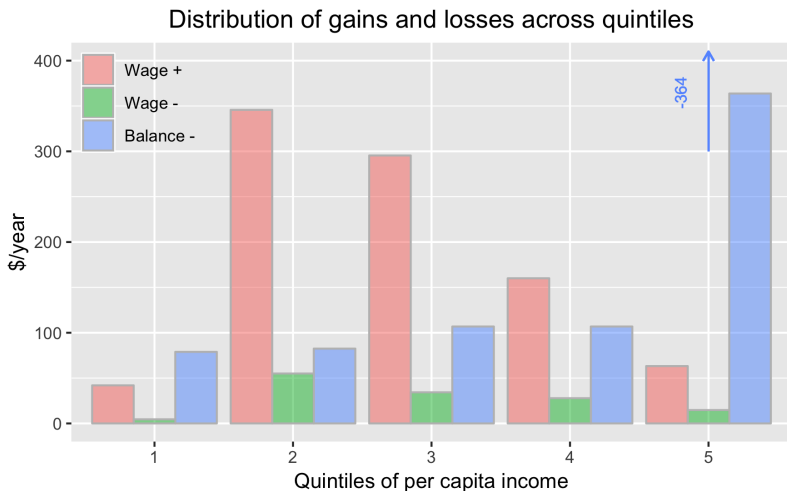


Figure: From (1PL, 6PL) ~ (1%, 29%, 70%) to (20%, 40%, 40%)



# Sensitivity Analysis For Multiple Parameters

**Table:**  $\% \Delta W$  for a  $\% \Delta$  in inputs. Two sample policy makers.

		Re-distributional Preferences			
		Dislikes ( $\rho = -0.1$ )		Likes ( $\rho = 0.1$ )	
Source	Input	$10\% \Delta^+$	$10\% \Delta^-$	$10\% \Delta^+$	$10\% \Delta^-$
Data					
	Annual wage growth ( $g_w$ )	-3%	2%	-2%	1%
	Annual growth in $N$	0.8%	-0.9%	0.5%	-0.5%
Research					
	$\eta_{teen}$	-4%	4%	-2%	2%
	Ripple Scope (8.7, 11.5)	37%	-24%	21%	-14%
	Ripple Intensity (50% $\Delta w$ )	5%	-5%	3%	-3%
Guess Work					
	Extrapolation factor ( $F_{ex}$ )	-3%	2%	-1%	1%
	Non compliance ( $\alpha_1$ )	-7%	7%	-4%	4%
	Substitution factor ( $F_{sub}$ )		20%		-8%
	Net benefits	-5%	5%	2%	-2%
	Distribution of balance losses				
	Current: (1%, 29%, 70%)				
	(1%, 4%, 95%)	22%		13%	
	(5%, 35%, 60%)	-17%		-9%	
	$1/N$	-129%		-73%	

# Limitations

- There is additional scope for reproducibility.
- Complete case study requires extensive institutional knowledge.
- Guidelines need to be build based on consensus of practitioners.

# What lies ahead

Let's assume this becomes the new status quo.

- Costs of producing the next report on effects of minimum wage will be very small.
- Every additional effort will imply improvements on the “state of the art” report (e. g.  $dB L$ ;  $\eta(MW)$ ,  $\alpha_1(MW)$ )
- Learning about one parameter (QALYs, DWL) will update estimates *across* reports.
- Much easier to have a substantive and normative policy debate.  
Pilot example: [Shiny App!](#).

# Your next steps to push OPA forward

- Collaborate with BITSS to open up your PA.
- Fund OPA: directly or conditionally.
- Train students/analysts in OPA.
- Present/showcase your OPA. Pioneers: GiveWell, AEI.
- Nominate a PA to be open [here](#).

"Democracy Thrives In  
Sunlight"

# The Wonk Times

Washington DC

VOL.III. . . No.14

MARCH 29, 2020

THREE DOLLARS

## *CBO Publishes Open Report on Minimum Wage*

*Results Will Be Published  
Separately in Two Weeks*

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero. nonummy eget. con-

nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

## *Bipartisan Support for CBO Methodology*

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non iusto. Nam lacus libero.

viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum.

# Thank you.

Pre-prints:

Why OPA

OPA Case Study

Slides at

<https://tinyurl.com/y9n7uwy5>

[fhoces@berkeley.edu](mailto:fhoces@berkeley.edu)