Feeling blue over the economy, will you pull down your face mask? Preventive health behaviour, psychological well-being, and economic anxiety

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Background

- With no immediate treatment, non-pharmaceutical interventions are critical to contain disease outbreaks.

- Physical distancing, wearing a mask, and cleaning hands are the most cost-effective precautions.

- More than 120 countries worldwide mandated the wearing of face masks in public to contain the first wave of COVID-19.

- Among these countries in the North African region are Egypt, Morocco, Sudan, and Tunisia.

- But the enactment of public health preventive measures does not necessarily imply compliance.

- While governments are using various tactics, such as fines, to enforce favorable measures, individual rather than government action is what counts in the battle against pandemics.

Existing Work

- Disease risk perception dominates research on the determinants of preventive health behavior (PHB).

- Beyond risk perception, little is known about how mental health affects engaging in PHB and the evidence is mixed.

- **Economic anxiety has become more salient than health anxiety over the course of COVID-19.**

- It is imperative to study how different economic factors can promote or discourage PHB.

- Studies to date focused on how socio-economic status can predict general PHB.
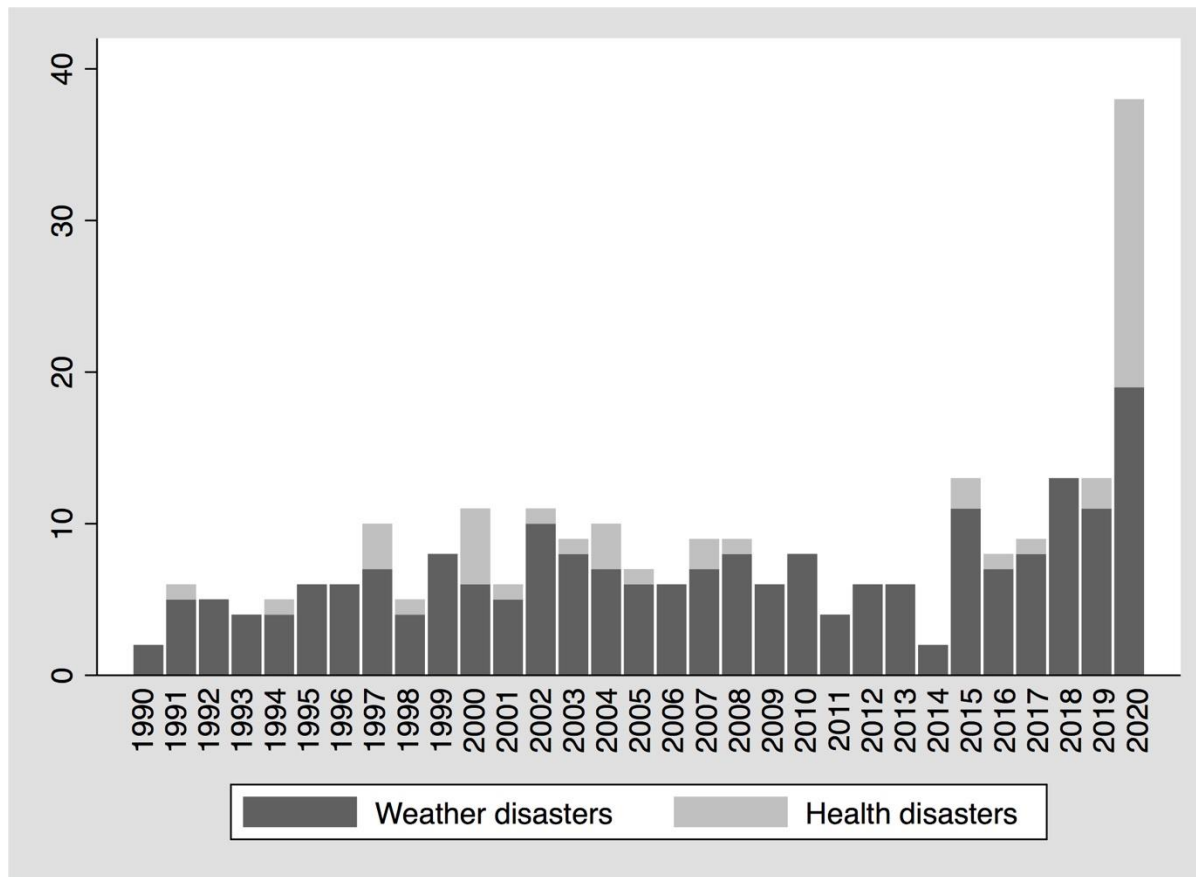
Motivation: Some Worrying Figures!

Changes in PHB in North Africa

(November 2020 – August 2021)
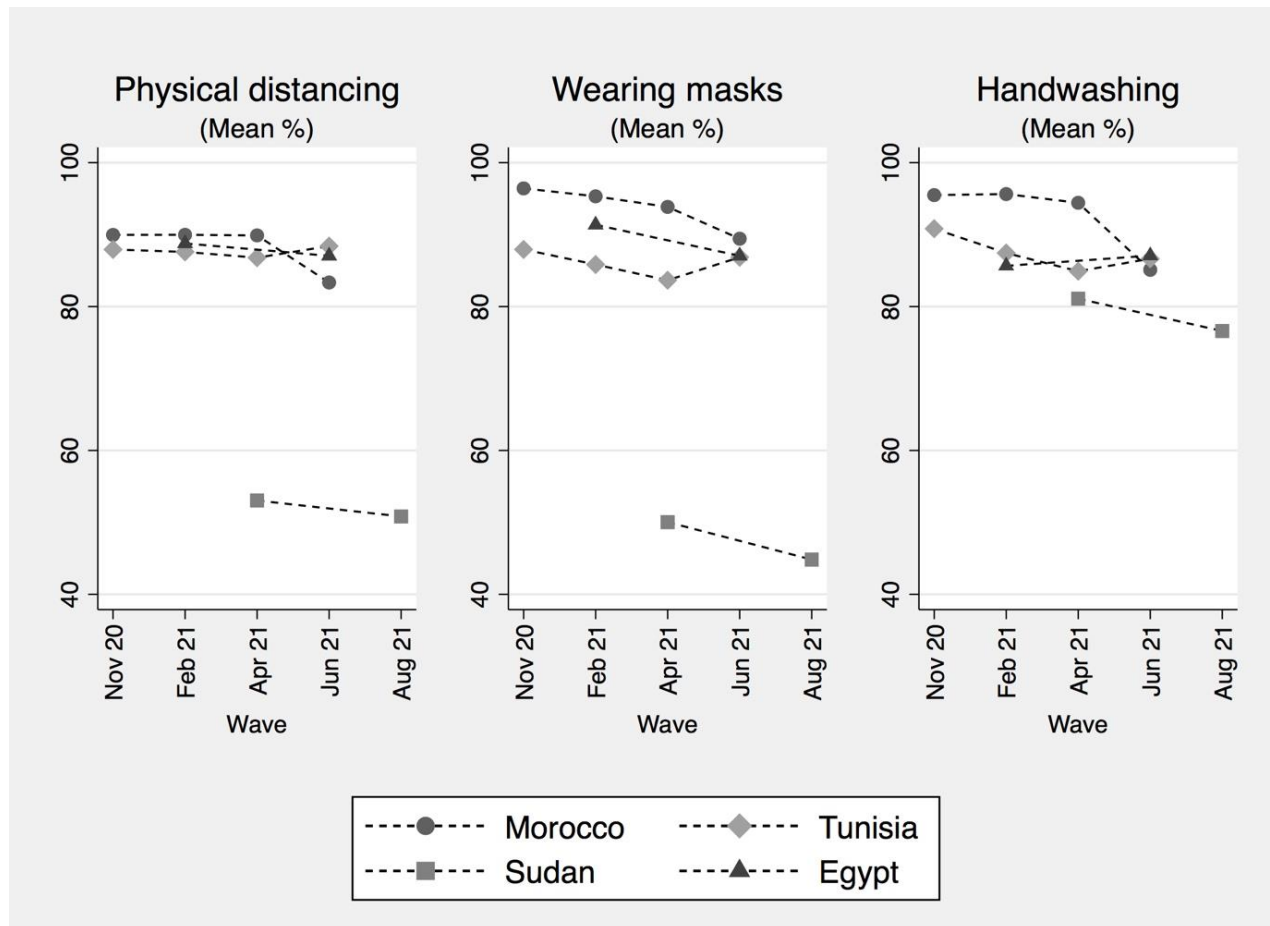
Motivation: And Even More Worrying!

Occurrence of weather and health disasters in the region

(1990 – 2020)

Objectives

- Examine what determines the uptake of PHB in the region in the context of COVID-19, bringing to the fore economic and psychological determinants:

    - Mental health, specifically psychological well-being

    - Economic determinants (anxiety, consumption, labor market)

    - COVID-19 risk perception

- What other determinants contributed to the prediction of non-compliance with COVID-19 preventive health measures?

- Guide policy makers to tailor their public health policies and communication for a strong effect on behaviour change and adherence during disease outbreaks, helping contain their spread.

Generalized Structural Equation Model

$$PHB_{it} = (\beta_0 + \boldsymbol{PWB_{it}}\beta_1 + R_{it}\beta_2 + Z_{it}\beta_3 + \eta_i + \epsilon_{it}) > 0 \qquad (1)$$

$$\boldsymbol{PWB_{it}} = \alpha_0 + R_{it}\alpha_1 + ECON_{it}\alpha_2 + Z_{it}\alpha_3 + \eta_i\alpha_4 + \xi_{it} \qquad (2)$$

- PHB_{it}: binary variable for individual i reporting adopting a PHB at wave t

- PWB_{it}: continuous "subjective" psychological well-being index from multiple correspondence analysis

- R_{it}: ordinal variable for individual perception of COVID-19 risk

- Z_{it}: vector capturing the neighbourhood effect (eq 1), the effect of confounding demographic and socioeconomic factors (eqs 1 & 2), and time (month) effect (eqs 1 & 2)

- $ECON_{it}$: vector of two economic determinants, namely economic anxiety and (food) consumption change

- η_i: common, unobserved component that gives rise to endogeneity - our "latent" variable

Data: Description

- Data source: Panel microdata from the ERF's COVID-19 MENA Monitor Household Survey

- Sample coverage:

  - Egypt (2 waves; Feb 2021, Jun 2021)

  - Morocco (4 waves; Nov 2020, Feb 2021, Apr 2021, Jun 2021)

  - Sudan (2 waves; Apr 2021, Aug 2021)

  - Tunisia (4 waves; Nov 2020, Feb 2021, Apr 2021, Jun 2021)

- Sample size:

  - 5,358 individuals (interviewed in at least 2 waves)

- Time framework: November 2020 – August 2021

Data: Variables

(Main) Dependent: PHB	Endogenous: Psychological well-being index	Other explanatory
Physical distancing	Cheerful & in good spirits	COVID-19 risk perception
Wearing masks	Calm & relaxed	Economic anxiety
Handwashing	Active & vigorous	Neighbourhood effect
	Fresh & rested	Demographic & socioeconomic factors
	Interested	

Results: GSEM Estimates of Psychological Well-being
Dependent variable: Psychological well-being index
System of equations: Physical distancing

Psychological well-being	Egypt		Morocco		Sudan		Tunisia	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
COVID-19 risk perception	-0.036*	-0.035*	-0.056**	-0.069***	0.028	0.039	-0.042***	-0.044***
	(0.020)	(0.020)	(0.025)	(0.023)	(0.048)	(0.045)	(0.016)	(0.016)
Economic anxiety	-0.101***	-0.079***	-0.165***	-0.110***	-0.145***	-0.149***	-0.065**	-0.065**
	(0.024)	(0.023)	(0.027)	(0.025)	(0.050)	(0.046)	(0.032)	(0.025)
Consumption change		-0.271***		-0.540***		0.000		-0.291***
		(0.051)		(0.073)		(0.168)		(0.058)
Gender (Ref: Male)		0.035		-0.118		-0.117		0.008
		(0.071)		(0.072)		(0.131)		(0.045)
Age		-0.003		0.004		0.003		-0.008***
		(0.003)		(0.002)		(0.004)		(0.002)
Education (Ref: Less than basic)								
Basic		0.048		-0.054		0.257*		0.101*
		(0.083)		(0.069)		(0.145)		(0.052)
Secondary		0.090		0.101		0.155		0.110**
		(0.065)		(0.072)		(0.133)		(0.044)
Higher education		-0.003		-0.054		0.170		0.194***
		(0.081)		(0.095)		(0.151)		(0.056)
Latent variable L	-0.611	-1.106*	-0.210**	0.178***	-0.239***	-0.203***	1.662	0.589
	(0.893)	(0.571)	(0.091)	(0.044)	(0.070)	(0.057)	(2.915)	(0.458)
Time effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location effect	No	Yes	No	Yes	No	Yes	No	Yes
Job/activity effect	No	Yes	No	Yes	No	Yes	No	Yes
N	1,766	1,766	4,886	4,886	904	904	6,766	6,766

10

Results: GSEM Estimates of PHB
Dependent variable: PHB – Physical distancing
System of equations: Physical distancing

PHB – Physical distancing	Egypt		Morocco		Sudan		Tunisia	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Psychological well-being	0.985	0.614***	1.059***	-0.174	1.617***	1.526***	-0.432	-0.776
	(1.017)	(0.204)	(0.130)	(0.157)	(0.367)	(0.307)	(0.454)	(0.476)
COVID-19 risk perception	0.361***	0.483***	0.497***	0.172	0.507**	0.480**	0.559***	0.532***
	(0.128)	(0.105)	(0.106)	(0.107)	(0.209)	(0.206)	(0.117)	(0.105)
Neighbourhood effect	0.086***	0.100***	0.131***	0.133***	0.101***	0.126***	0.084***	0.094***
	(0.016)	(0.007)	(0.020)	(0.019)	(0.016)	(0.020)	(0.008)	(0.011)
Gender (Ref: Male)		-0.227		1.685***		0.035		0.760**
		(0.396)		(0.432)		(0.641)		(0.297)
Age		0.042**		0.025*		-0.027		0.041***
		(0.017)		(0.013)		(0.023)		(0.011)
Education (Ref: Less than basic)								
Basic		-0.136		-0.633**		0.029		0.187
		(0.437)		(0.318)		(0.795)		(0.287)
Secondary		0.293		-0.569*		0.020		0.036
		(0.353)		(0.329)		(0.642)		(0.248)
Higher education		0.567		-1.549***		0.121		-0.027
		(0.408)		(0.447)		(0.687)		(0.309)
Latent variable L	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Time effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location effect	No	Yes	No	Yes	No	Yes	No	Yes
Job/activity effect	No	Yes	No	Yes	No	Yes	No	Yes
N	1,766	1,766	4,886	4,886	904	904	6,766	6,766

Notes: Each column represents a separate regression. Robust standard errors clustered at the individual level are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Results: GSEM Estimates of PHB
Dependent variable: PHB – Wearing masks
System of equations: Wearing masks

PHB – Wearing masks	Egypt		Morocco		Sudan		Tunisia	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Psychological well-being	1.684**	1.294	1.063***	0.956***	1.776***	1.684***	1.075***	1.010**
	(0.841)	(1.029)	(0.165)	(0.144)	(0.303)	(0.357)	(0.336)	(0.408)
COVID-19 risk perception	0.680***	0.683***	0.707***	0.726***	0.412*	0.391*	0.781***	0.643***
	(0.174)	(0.175)	(0.145)	(0.161)	(0.240)	(0.205)	(0.101)	(0.096)
Neighbourhood effect	0.100***	0.110***	0.192***	0.198***	0.090***	0.093***	0.095***	0.097***
	(0.029)	(0.034)	(0.040)	(0.040)	(0.018)	(0.018)	(0.013)	(0.015)
Gender (Ref: Male)		-0.214		0.932*		0.270		1.637***
		(0.593)		(0.481)		(0.614)		(0.414)
Age		0.038		0.025*		-0.012		0.049***
		(0.027)		(0.015)		(0.021)		(0.015)
Education (Ref: Less than basic)								
Basic		0.336		-0.161		-1.088		0.095
		(0.516)		(0.455)		(0.749)		(0.306)
Secondary		0.714*		-0.759**		0.278		0.042
		(0.415)		(0.350)		(0.587)		(0.264)
Higher education		0.594		-0.426		0.700		-0.067
		(0.541)		(0.459)		(0.681)		(0.367)
Latent variable L	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Time effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location effect	No	Yes	No	Yes	No	Yes	No	Yes
Job/activity effect	No	Yes	No	Yes	No	Yes	No	Yes
N	1,766	1,766	4,886	4,886	904	904	6,766	6,766

Notes: Each column represents a separate regression. Robust standard errors clustered at the individual level are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Results: GSEM Estimates of PHB
Dependent variable: PHB – Handwashing
System of equations: Handwashing

PHB – Handwashing	Egypt		Morocco		Sudan		Tunisia	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Psychological well-being	0.818	-0.036	0.703	0.335***	-0.248	-0.916	0.266	0.103
	(1.054)	(0.160)	(0.550)	(0.080)	(1.114)	(0.800)	(0.295)	(0.238)
COVID-19 risk perception	0.536***	0.581***	0.647***	0.540***	0.272	0.243	0.771***	0.734***
	(0.152)	(0.102)	(0.145)	(0.108)	(0.196)	(0.213)	(0.093)	(0.086)
Neighbourhood effect	0.083***	0.089***	0.112***	0.112***	0.073***	0.104**	0.078***	0.080***
	(0.017)	(0.006)	(0.020)	(0.013)	(0.017)	(0.043)	(0.006)	(0.006)
Gender (Ref: Male)		-0.731**		0.597*		-0.252		0.382
		(0.359)		(0.342)		(0.647)		(0.243)
Age		0.027*		0.020		0.024		0.029***
		(0.014)		(0.013)		(0.021)		(0.010)
Education (Ref: Less than basic)								
Basic		0.924**		-0.419		0.158		-0.293
		(0.464)		(0.315)		(0.798)		(0.242)
Secondary		0.696*		-0.668**		0.876		-0.287
		(0.362)		(0.326)		(0.832)		(0.226)
Higher education		0.753*		-0.641		1.004		-0.503*
		(0.401)		(0.422)		(0.922)		(0.257)
Latent variable L	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Time effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location effect	No	Yes	No	Yes	No	Yes	No	Yes
Job/activity effect	No	Yes	No	Yes	No	Yes	No	Yes
N	1,766	1,766	4,886	4,886	904	904	6,766	6,766

Notes: Each column represents a separate regression. Robust standard errors clustered at the individual level are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Conclusions

- We show that through affecting psychological well-being, economic determinants can impact PHB adoption.

- Our estimates reveal heterogeneity in individual responses to different PHB determinants across countries and by behavior type.

- Psychological well-being has the strongest effect on the likelihood of physical distancing in Egypt and Sudan and of wearing masks in Morocco, Sudan, and Tunisia.

- Psychological well-being in turn is largely affected by changes in food consumption and economic anxiety in all four countries.

- Handwashing, a less publicly visible practice, is affected by COVID-19 risk perception followed by neighborhood compliance.

- Gender, age, education, and labor market status effects varied across countries and by PHB type.

Policy Implications

- Mitigating the negative effects of an outbreak on consumption changes and considering labor market status can promote PHB.

- Addressing mental distress and economic anxiety during public health crises can help increase the likelihood of engagement in PHB.

- An increased focus of public communication strategies on risk communication (i.e., raising levels of perceived COVID-19 threat) can also help increase the uptake of PHB.

- Governments may wish to consider tailoring their communication strategies to typically non-complying population segments. For instance, for young adults with low self-control, nudging may increase compliance.

Thank you.