

Policy Dialogue Workshop Social Protection System in Tunisia

Do social protection programs improve health
related outcomes of the poor in Tunisia?

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Monday, 24th January 2021

Introduction

- Role of **regular** social protection programs in the **Covid crisis**
- **Why** assessing the impact of social protection?
- **Focus of the paper:** impact of the PNAFN on health related outcomes
- The issue of **selection** in the program
- **The variables of interest:** out-of-pocket expenditures, the protection from financial shocks and healthcare utilization

The channels of transmission

- Higher and more stable income
- Lower risks of facing large expenditures drops
- Higher capacities to buy more and better quality food, cleaner environment and less stress
- Free or subsidized healthcare: higher utilization
- Availability and quality of public healthcare?
- Increase of out-of-pocket expenditure
 - Shift to the right of the demand curve
 - Higher awareness of healthcare + low availability of medicines

Literature Review

- Acharya et al. (2012)
 - Weak evidence of impact of the programs on the variables of interest
 - Increase of out-of-pocket spending for the poorest households
- Erlangga et al. (2019)
 - Positive impact of state-funded health insurance on healthcare use
 - Mixed effects on protection from financial risk (mostly positive or insignificant)
- Previous studies on Tunisia
 - Abu-Zaineh et al. (2013): The odds of facing catastrophic health expenditures twice lower
 - Makhloufi et al. (2015): Excluded individuals use healthcare services significantly less

Lessons from main other studies

- Using Matching and **Differences-in-differences**
 - **Wagstaff et al. (2009)**: improvement in healthcare utilization but no effect on out-of-pocket (OOP) in Rural China
 - **Wagstaff (2010)**: substantial decrease in OOP, but no impact on healthcare services in Vietnam
 - **Sparrow et al. (2013)**: increase in outpatient utilization but also in OOP spending + slightly higher incidence of catastrophic spending in Indonesia
- **Regression Discontinuity Designs**
 - **Miller et al. (2013)**: positive impact of health insurance on health utilization + lower OOP in Colombia (inpatient care)
 - **Bernal et al. (2017)**: positive effect on healthcare use + higher OOP + no effect on financial risk in Peru
- **Instrumental variables**
 - **Wagstaff and Lindelow (2008)**: increase OOP and catastrophic expenditures

Health coverage through Social Protection in Tunisia

- The Tunisian social protection system offers two different types of health coverage :
 - The mandatory contributory health insurance scheme covering formal workers, retirees and their dependents ;
 - Two flagship non-contributory programs allowing the poor and informal workers to access public health care
- In 2020, around one million 700 thousand people would be completely deprived of any health coverage, i.e. 14% of the entire population

Indicators on health spending in Tunisia

	2007	2010	2011	2013	2015	2017	2019
Current Health Expenditure (CHE) as % Gross Domestic Product (GDP)	5	6	6	7	7	7	7
Current Health Expenditure (CHE) per Capita in US\$	205	244	274	290	256	237	233
Out-of-pocket (OOP) as % of Current Health Expenditure (CHE)	43	42	42	39	39	39	38

Source : Data compiled from the WHO database : <https://apps.who.int/nha/database/>

- The out-of-pocket (OPP) ratio of current health care expenditures has declined significantly since the CNAM came into effect in 2007, from 43% to around 38% in 2019
- Compared to the levels prevailing in other countries, the OOP is deemed high : 20% on average in OECD countries, 16.9% in Turkey, 24.9% in Brazil and 7.7% in South Africa



While it is known that the **CNAM has contributed to a reduction in OOP expenditure**, what about the **non-contributory programmes PNAFN and AMGII and their differentiated impacts** on the target populations (The poorest, the most vulnerable and informal workers) ?

Beneficiaries Profile

- According to administrative registries, 55.3% of PNAFN beneficiaries are aged 60 years and over
- One out of four post-revolutionary PNAFN beneficiaries belongs to an age group that is still active in the labour market, i.e. 40-59 years
- 50.9% of the beneficiaries live in the regions of the west of Tunisia, the north-west, the centre-west and the south, i.e. successively 21.2%, 19.4% and 10.4%.

Eligibility Criteria

- Process of identifying eligible households entirely centred on the role of social workers
- Cash Transfer + AMGI : An adjusted annual per capita income of no more than 585 DT or 290 USD, the incapacity of all family members to work, the absence of family support, the disability and/or chronic illness of a family member, and deteriorated living conditions (Circular 2011)
- Household income requirements for AMGII based on household size
- A decree was issued in 2020, which adopts unified eligibility criteria underlying a classification drawn up at the level of each governorate

Identification errors and use of Public health Facilities by AMGI and AMGII beneficiaries

- According to Bibi and Ben Cheikh (2017), the inclusion errors (type I) for the PNAFN would be around 53% and 49.7% for the AMGII
- The PNAFN/AMGII covers 30% of the poorest quintile of the population in Tunisia compared to higher levels for Croatia (55%) and Belarus (37.5%)
- For conditional cash transfer programmes, coverage levels are even higher: 73.2% for Uruguay (Asignaciones Familiares Programme), 59.2% for Brazil (Bolsa Familia Programme)
- Households receiving AMGI, which represent 8% of Tunisian households, benefited from 14% of the care provided in public facilities, compared to only 13% for households with AMGII cards, whose weight in the population is approximately 22% (World Bank 2016)

Data

- 2015 National Survey on Household Budget, Consumption and Living Standards (EBCNV)
 - Individual demographic and economic characteristics
 - Individual affiliation to main health insurance funds (AMG I, AMG II and CNAM) and basic healthcare service utilization
 - Household spending
- We measure the impact of PNAFN on :
 - Households' health spending and their risk of incurring high and catastrophic health expenditures
 - Health service utilization
- Comparing the PNAFN group with 3 control groups: AMG II, CNAM and no-coverage families.

Empirical strategy

2 challenges:

- Selection bias
- Nature of the data

Selection bias:

PNAFN targets the most vulnerable households of which one or many members are not able to work due to old age, chronic condition and/or disability.

→ On one hand, the PNAFN beneficiaries are likely to have higher spending on curative health services and products

→ On the other hand, they might be constrained by their meagre earnings, thus, tend to spend less on healthcare.

Empirical strategy

Solution: Instrumental variable

...The loss of the father of the family due to death, imprisonment or abandonment with the deterioration of the material capacity of the family...

→ Instrumental variable: female heading household

Empirical strategy

Nature of the data:

- Non-negative outcome variables
- Right-skewed distribution outcomes
- A nontrivial fraction of zero values
- Binary PNAFN variable

Solutions:

- For actual health expenses: OLS, GLM, 2SLS, 2SRI
- For high and catastrophic health expenses and healthcare utilization: Probit, Biprobit

Descriptive statistics

Table 1: Mean of covariates across sub-samples

	All households (N=23,675)	PNAFN (N=1,919)	AMG II (N=3,473)	CNAM (N=15,956)	No coverage (N=2,327)
<i>Instrumental variable for PNAFN</i>					
Female household header	0.16	0.42	0.13	0.12	0.31
<i>Household characteristics</i>					
Per capita annual expenses	4483.81	2706.2	2531.04	5018.38	3893.6
Number of working people	1.14	0.68	1.11	1.22	0.88
Number of rooms per person	0.97	0.98	0.76	0.99	1.08
Number of people with disabilities	0.13	0.30	0.13	0.11	0.13
Number of people with chronic disease	0.62	0.83	0.52	0.64	0.48
Distance to local hospital (km)	5.99	9.01	10.16	4.89	7.45
Education of household header	2.27	1.46	1.80	2.46	1.99
Number of >=65 year old people	0.35	0.61	0.31	0.34	0.32
Household size	3.96	3.29	4.25	4.03	3.55

Descriptive statistics

Table 2: Mean of outcomes across sub-samples

	All households (N=23,675)	PNAFN (N=1,919)	AMG II (N=3,473)	CNAM (N=15,956)	No coverage (N=2,327)
<i>Outcomes</i>					
Per capita annual healthcare spending (dinar)	250.91	201.18	165.74	269.35	243.87
Outpatient spending	221.00	185.94	146.47	236.28	215.97
- Spending on doctor visits	45.67	33.34	28.09	49.29	46.77
- Spending on medicines	109.91	106.40	75.44	115.11	113.54
- Spending on medical analysis	27.49	22.83	17.08	30.09	23.28
Inpatient spending	27.10	15.09	18.33	29.97	23.43
Per capita annual healthcare spending					
- exceeds the median	0.51	0.43	0.48	0.53	0.47
- exceeds the 75th percentile	0.29	0.26	0.25	0.31	0.28
- exceeds 5% of the mean	0.34	0.30	0.28	0.35	0.32
- exceeds 10% of the mean	0.33	0.29	0.27	0.34	0.31
- exceeds 15% of the mean	0.32	0.28	0.26	0.33	0.30
- exceeds 20% of the mean	0.31	0.27	0.25	0.32	0.29
- exceeds 25% of the mean	0.30	0.27	0.24	0.31	0.29
Share of annual healthcare spending					
- exceeds 5% of total spending	0.37	0.38	0.39	0.37	0.36
- exceeds 10% of total spending	0.19	0.23	0.21	0.18	0.20
- exceeds 15% of total spending	0.10	0.14	0.12	0.10	0.11
- exceeds 20% of total spending	0.06	0.09	0.07	0.05	0.07
- exceeds 25% of total spending	0.03	0.05	0.04	0.03	0.04
Visited the doctor when having an illness	0.93	0.89	0.90	0.94	0.90
Did not visit the doctor due to lack of resources	0.13	0.33	0.25	0.07	0.24

Results

Table 3: PNAFN vs. No coverage

	OLS/Probit			Poisson-GLM			IV-2SLS/Biprobit				2SRI		
	Coef./ AME	SE	p-value	Coef.	SE	p-value	Coef./ AME	SE	p-value	Wald test (prob)	Coef.	SE	p-value
Actual health spending	-44.524	21.737	0.041	-0.142	0.098	0.148	-3.17	309.6	0.992	0.387	-0.137	0.108	0.205
Outpatient spending	-30.892	17.818	0.083	-0.098	0.087	0.26	-97.364	269.167	0.718	0.531	0.018	0.098	0.857
Spending on doctor visits	-9.946	4.274	0.02	-0.208	0.105	0.047	-117.239	80.189	0.144	0.195	0.058	0.082	0.476
Spending on medicines	-14.455	8.556	0.091	-0.068	0.073	0.357	-56.179	150.367	0.709	0.307	0.095	0.049	0.051
Spending on medical analysis	-0.232	11.662	0.984	0.058	0.503	0.908	80.513	147.486	0.585	0.718	NA	NA	NA
Inpatient spending	-12.278	7.202	0.088	-0.537	0.38	0.157	106.172	98.996	0.284	0.367	NA	NA	NA
Healthcare spending													
- exceeds the median	-0.047	0.018	0.011				-0.122	0.026	0.000	0.009			
- exceeds the 75th percentile	-0.029	0.016	0.072				-0.121	0.031	0.000	0.003			
- exceeds 5% of the mean	-0.034	0.017	0.043				-0.134	0.025	0.000	0.001			
- exceeds 10% of the mean	-0.031	0.017	0.058				-0.132	0.028	0.000	0.003			
- exceeds 15% of the mean	-0.029	0.017	0.075				-0.122	0.033	0.000	0.008			
- exceeds 20% of the mean	-0.027	0.016	0.093				-0.125	0.031	0.000	0.003			
- exceeds 25% of the mean	-0.027	0.016	0.093				-0.118	0.03	0.000	0.003			
Share of healthcare spending													
- exceeds 5% of total spending	-0.036	0.018	0.048				-0.158	0.006	0.000	0.001			
- exceeds 10% of total spending	-0.019	0.015	0.216				-0.169	0.02	0.000	0.001			
- exceeds 15% of total spending	-0.008	0.012	0.521				-0.09	0.044	0.041	0.023			
- exceeds 20% of total spending	-0.005	0.01	0.572				-0.056	0.037	0.136	0.063			
- exceeds 25% of total spending	0.002	0.007	0.798				-0.078	0.045	0.085	0.006			
Visited the doctor when having an illness	-0.002	0.013	0.85				0.011	0.035	0.758	0.717			
Did not visit the doctor due to lack of resources	0.032	0.028	0.255				0.068	0.038	0.074	0.28			

Note: The table presents coefficient estimates/average marginal effects, robust standard errors and p-value for PNAFN variable. The models compare between PNAFN beneficiaries and no-coverage households. The first column shows the variable on the LHS of the equations. All models include the covariates listed in Table 2. OLS, Poisson-GLM, IV-2SLS and 2SRI estimator are applied to the continuous outcomes. Bootstrapped standard errors are reported for the 2SRI estimator. NA indicates no available estimate provided due to the lack of variation ($\geq 90\%$ observations have a zero outcome). Probit and Biprobit estimator are applied to the binary outcomes. The instrumental variable for PNAFN in the 2-step models is a dummy variable which takes the value 1 if the household header is female. The null hypothesis of the Wald test of endogeneity is that the PNAFN can be treated as exogenous; a rejection implies that the PNAFN is endogenous.

Results

Table 4: PNAFN vs. AMG II

	OLS/Probit			Poisson-GLM			IV-2SLS/Biprobit				2SRI		
	Coef./ AME	SE	p-value	Coef.	SE	p-value	Coef./ AME	SE	p-value	Wald test (prob)	Coef.	SE	p-value
Actual health spending	-5.265	16.464	0.749	-0.008	0.087	0.926	80.777	84.817	0.341	0.045	-0.128	0.089	0.149
Outpatient spending	6.47	12.897	0.616	0.056	0.075	0.457	71.984	67.69	0.288	0.056	-0.09	0.101	0.376
Spending on doctor visits	0.071	2.875	0.98	0.022	0.092	0.814	-14.619	15.481	0.345	0.344	0.028	0.167	0.866
Spending on medicines	6.364	6.427	0.322	0.093	0.068	0.174	51.063	29.713	0.086	0.048	0.235	0.087	0.007
Spending on medical analysis	3.847	8.765	0.661	0.199	0.401	0.62	37.263	47.171	0.43	0.244	NA	NA	NA
Inpatient spending	-11.191	5.822	0.055	-0.582	0.349	0.096	10.742	27.326	0.694	0.276	-0.691	0.291	0.018
Healthcare spending													
- exceeds the median	-0.069	0.017	0.000				-0.043	0.024	0.066	0.395			
- exceeds the 75th percentile	-0.029	0.014	0.038				-0.039	0.024	0.105	0.22			
- exceeds 5% of the mean	-0.024	0.015	0.104				-0.034	0.024	0.159	0.273			
- exceeds 10% of the mean	-0.023	0.015	0.125				-0.036	0.024	0.141	0.234			
- exceeds 15% of the mean	-0.018	0.015	0.224				-0.03	0.024	0.214	0.305			
- exceeds 20% of the mean	-0.017	0.014	0.241				-0.039	0.024	0.113	0.16			
- exceeds 25% of the mean	-0.016	0.014	0.268				-0.047	0.024	0.048	0.067			
Share of healthcare spending													
- exceeds 5% of total spending	-0.037	0.017	0.03				-0.051	0.025	0.039	0.119			
- exceeds 10% of total spending	-0.023	0.014	0.097				-0.032	0.026	0.208	0.32			
- exceeds 15% of total spending	-0.013	0.011	0.251				-0.026	0.026	0.316	0.358			
- exceeds 20% of total spending	-0.003	0.008	0.686				0.006	0.015	0.71	0.669			
- exceeds 25% of total spending	-0.002	0.006	0.755				0.009	0.009	0.322	0.366			
Visited the doctor when having an illness	0.003	0.012	0.792				0.006	0.015	0.663	0.703			
Did not visit the doctor due to lack of resources	0.057	0.025	0.021				0.064	0.012	0.000	0.014			

Note: The table presents coefficient estimates/average marginal effects, robust standard errors and p-value for PNAFN variable. The models compare between PNAFN and AMG II beneficiaries. The first column shows the variable on the LHS of the equations. All models include the covariates listed in Table 2. OLS, Poisson-GLM, IV-2SLS and 2SRI estimator are applied to the continuous outcomes. Bootstrapped standard errors are reported for the 2SRI estimator. NA indicates no available estimate provided due to the lack of variation (>= 90% observations have a zero outcome). Probit and Biprobit estimator are applied to the binary outcomes. The instrumental variable for PNAFN in the 2-step models is a dummy variable which takes the value 1 if the household header is female. The null hypothesis of the Wald test of endogeneity is that the PNAFN can be treated as exogenous; a rejection implies that the PNAFN is endogenous.

Results

Table 5: PNAFN vs. CNAM

	OLS/Probit			Poisson-GLM			IV-2SLS/Biprobit				2SRI		
	Coef./ AME	SE	p-value	Coef.	SE	p-value	Coef./ AME	SE	p-value	Wald test (prob)	Coef.	SE	p-value
Actual health spending	-60.353	17.087	0.000	-0.182	0.08	0.023	-9.557	159.305	0.952	0.068	-0.051	0.058	0.373
Outpatient spending	-46.788	13.986	0.001	-0.154	0.071	0.031	15.051	137.376	0.913	0.048	-0.044	0.053	0.408
Spending on doctor visits	-14.895	3.928	0.000	-0.319	0.098	0.001	-38.881	32.933	0.238	0.435	-0.105	0.067	0.118
Spending on medicines	-22.179	8.034	0.006	-0.109	0.074	0.138	157.159	106.764	0.141	0.001	0.061	0.048	0.204
Spending on medical analysis	-5.693	8.354	0.496	-0.134	0.359	0.709	-24.238	41.29	0.557	0.899	-1.134	0.806	0.16
Inpatient spending	-13.783	5.298	0.009	-0.443	0.293	0.131	-25.825	72.945	0.723	0.846	-0.16	0.238	0.502
Healthcare spending													
- exceeds the median	-0.084	0.015	0.000				-0.017	0.002	0.000	0.000			
- exceeds the 75th percentile	-0.029	0.013	0.03				-0.012	0.004	0.001	0.003			
- exceeds 5% of the mean	-0.032	0.014	0.021				-0.013	0.003	0.000	0.001			
- exceeds 10% of the mean	-0.029	0.014	0.035				-0.012	0.003	0.000	0.002			
- exceeds 15% of the mean	-0.025	0.014	0.066				-0.011	0.003	0.001	0.003			
- exceeds 20% of the mean	-0.022	0.014	0.108				-0.011	0.004	0.002	0.004			
- exceeds 25% of the mean	-0.021	0.013	0.119				-0.011	0.004	0.001	0.003			
Share of healthcare spending													
- exceeds 5% of total spending	-0.043	0.014	0.003				-0.021	0.003	0.000	0.000			
- exceeds 10% of total spending	-0.004	0.011	0.707				-0.014	0.004	0.002	0.001			
- exceeds 15% of total spending	0.005	0.008	0.547				-0.012	0.005	0.011	0.001			
- exceeds 20% of total spending	0.008	0.006	0.166				-0.004	0.004	0.271	0.082			
- exceeds 25% of total spending	0.009	0.004	0.02				0.000	0.002	0.822	0.374			
Visited the doctor when having an illness	-0.026	0.007	0.000				-0.004	0.001	0.000	0.288			
Did not visit the doctor due to lack of resources	0.091	0.01	0.000				0.015	0.002	0.000	0.421			

Note: The table presents coefficient estimates/average marginal effects, robust standard errors and p-value for PNAFN variable. The models compare between PNAFN and CNAM beneficiaries. The first column shows the variable on the LHS of the equations. All models include the covariates listed in Table 2. OLS, Poisson-GLM, IV-2SLS and 2SRI estimator are applied to the continuous outcomes. Bootstrapped standard errors are reported for the 2SRI estimator. Probit and Biprobit estimator are applied to the binary outcomes. The instrumental variable for PNAFN in the 2-step models is a dummy variable which takes the value 1 if the household header is female. The null hypothesis of the Wald test of endogeneity is that the PNAFN can be treated as exogenous; a rejection implies that the PNAFN is endogenous.

Conclusions

- The access to PNAFN (and AMG I) has no effects on actual total health expenses.
- However, it reduces the risks of incurring high and catastrophic out-of-pocket expenses, compared to CNAM and no-coverage group
- It also encourages the PNAFN families to spend more on medications than any of three control groups
- Regarding the effects of PNAFN relative to AMG II, we find little significant distinction between the two programs.