Accounting for Interdependent Risks in Vulnerability Assessment of Refugees

Rischi Interdipendenti per la Misura della Vulnerabilità dei Rifugiati

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Abstract The United Nations' Vulnerability Assessment Framework (VAF) of refugees encompasses a set of indicators of the living conditions in refugee camps in Lebanon and Jordan; it assumes the independence among its components. In this paper we maintain the importance to account for existing interdependencies, and provide a definition of vulnerability for high income countries. The proposed "vulnerability scale", based on the estimated joint risk of social isolation, economic deprivation and bad health, is a useful tool to address interventions toward selected groups of more vulnerable refugees. Analyses are based upon the survey of refugees carried on in Germany in 2016. Germany is the first country in Europe for the number of hosted refugees.

Abstract Per la misura della vulnerabilità dei rifugiati le Nazioni Unite hanno proposto il modello VAF, che adotta un insieme di indicatori delle condizioni di vita nei campi profughi in Libano e Giordania. Il VAF assume l'indipendenza delle sue componenti. In questo lavoro si propone invece di tener conto delle interrelazioni tra le componenti della vulnerabilità e si ragiona sul concetto di vulnerabilità nei paesi ad alto reddito. La scala di valutazione della vulnerabilità qui proposta- basata sulla stima del rischio congiunto di isolamento sociale, povertà e cattiva salute- costituisce un utile strumento per indirizzare le azioni di sostegno verso i gruppi maggiormente a rischio vulnerabilità. Le analisi sono basate sull'indagine sui rifugiati fatta in Germania nel 2016, il primo paese in Europa per numero di rifugiati accolti.

Key words: trivarite logit, poverty, health, social isolation, VAF, Germany, IAB-BAMF-SOEP.

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1 Introduction and literature review

The UNHCR -United Nations High Commissioner for refugees- data [15] assessed in 2019 25.9 million of refugee worldwide in 2018. Most of them fled in neighbourhood countries. Refugees living in camps, such as those in Jordan, experience hard living conditions [5]. Worst conditions are experienced in Lebanon, where in 2015 the Government stopped the UNHCR's registration of refugees (but not the entrance) in order to make not visible the huge amount of hosted refugees (16.7% of its population according to the last UNHCR registration).

In recent years, a growing number of refugees arrived also to Europe and several countries are struggling in processing the high number of applications for international protection. The 2018 was a peak year in Europe, following the preceding 5 years of steep increase. Eurostat database counts for 1,127,690 new refugees in EU-28 at 31st December 2018 (up to 1,635,289 considering also holders of subsidiary protection), of these 662,954 were hosted in Germany (up to 888,016 including subsidiary protection). Recently emerging conflicts in West Asia and in several African countries make reasonable to think that these flows and stocks will increase rapidly in the next future.

While there are several academic and institutional studies on the quality of life and refugees' vulnerability in medium-low income countries, mostly on Lebanon and Jordan (e.g. [11, 5]), very few studies deal with the vulnerability of refugees and asylum seekers in Europe (see e.g., [2, 3, 8, 9, 10]).

In 2017 the UNHCR [13,14] developed the Vulnerability Assessment Framework (VAF). It is a scoreboard for targeting individuals for intervention. VAF encompasses 10 thematic areas, through 65 indicators, covering a wide spectrum of needs of refugees in camps (health, shelter, food security, documentation, education, economic deprivation, etc.). Noteworthy the UN's VAF hardly fits in high income countries where the dimensions of vulnerability go beyond that of basic needs.

Although this growing literature, still little has been done to study the vulnerability of refugees and asylum seekers in high-income countries. In qualitative study [2] on Iraqi and Iranian refugees in Greece, the authors discuss about adequacy of several indicators for measuring vulnerability at household and individual level; [3] measures vulnerability among refugees and asylum seekers living in informal settlements in Italy; [4] focuses on the assessment of the environmental health conditions and associated vulnerability of migrant residents in the Calais (France) refugee camp, analysing a set of indicators but not providing a synthetic measure of multidimensional vulnerability; [9] focuses on two health outcomes of forced migrants living in informal settlements in Italy and find that they are associated with both personal and settlement characteristics. None of these studies (except [3]) takes into account the correlations between items of vulnerability, which introduce a "double counting/weighting" effect in the measurement of vulnerability.

We propose a measure of vulnerability of refugee communities in high-income countries that deals with this correlation by modelling the joint probability of experiencing interdependent risks. Our analysis focuses on Germany, since it is the 5-th hosting countries for refugees worldwide ([15]) and first in Europe.

In the following, we first briefly introduce our theoretical and then statistical model along with data on refugees living in Germany, then we discuss some results (primarily our vulnerability scale) and reflections on future research paths.

2 Models and Data

The Theoretical Model. Vulnerability is the "*state of high exposure to certain risks, combined with a reduced ability to protect or defend oneself against those risks and cope with their negative consequences*" ([12], p. 210). Our theoretical framework acknowledges that these risks are often highly interrelated, producing a cumulative disadvantage that goes beyond the sum of parts. In the context of high income countries, particularly Germany (the European country with the highest presence of refugees), where basic needs are usually provided to refugees under the mandate of the Genève Convention, we assume that main risks are those of social isolation, economic deprivation and bad health.

The Statistical Model. In order to accomplish for the interdependence of these risks, we estimate a trivariate logit model to evaluate how individual and household characteristics are associated with the probability of experiencing each risk, and make inference also on the residual association between pairs of risks, conditionally to a set of selected covariates. Hence, we jointly model: a) the univariate marginal distribution by assuming a linear model for each logit in equation (1), where Y_1 is the outcome variable "social isolation" (that is: feeling very/often socially isolated), Y_2 refers to "perceived economic difficulties" (i.e. being very/somewhat concerned about finances) and Y_3 to "bad health" (i.e. reporting poor or bad health); and b) the marginal association between each pair of responses, modelled by a set of odds ratios described in equation (2). We include a core set of variables explaining all the observed outcomes (household composition -size and marital status-, education -three levels-, employment -yes/no/seeking-, years since migration, having any form of international protection- and nationality groups- most likely to remain (Afghans, Syrians, Eritreans, Iraqis) vs. others-) and specific sets pertaining to each single risk Y_k (frequency of social relations, knowledge of German language, health problems limiting social relations for Y_1;allowances and benefits received, disability for Y_2; physical and mental health impairments-four variables- for Y_3) The whole matrix of covariates is here referred as Z.

The model for the risk of social isolation particularly includes language skills, social network and health measures; the risk of perceived financial difficulties is modelled including also benefits dependence, health and quality of housing

measures, the one for the risk of bad health includes quality of housing and state benefit dependence.

Data are from the IAB-BAMF-SOEP Survey of Refugees in Germany that is a longitudinal survey of people who entered Germany between 2013 and 2016 and applied for asylum, whatever the result of the application. It includes information on individual socio-demographic characteristics and household level information.

The survey is provides yearly interviews of household members aged 18 and over. We exploit the first wave of the survey (2016). Our sample is made of 3,072 adults, with a prevalence of men (62%), a mean age of 33.6 years, with four nationalities (Afghan, Eritrean, Iraqi, and Syrian) accounting for about 82% of the sample. Among them, only 59% were granted any form of international protection - refugee status (73.66%), international protection, status of tolerance- while the remaining 41% is lacking of this status (among these 85.67% are asylum applicants with a pending request).

$$\log\frac{\Pr(Y_k=1)}{\Pr(Y_k=0)} = -\gamma_k + z_k'\tau_k \qquad k=1,2,3 \qquad (1)$$

$$\lambda_{hk} = \log\frac{\Pr(Y_h=1,Y_k=1\mid z)\Pr(Y_h=0,Y_k=0\mid z)}{\Pr(Y_h=0,Y_k=1\mid z)\Pr(Y_h=1,Y_k=0\mid z)} \qquad \forall\, h,k\in\{1,2,3\} \qquad (2)$$

3 The Vulnerability Scale

Results from the trivariate logit reveals a significant conditional association between the three risks supporting the hypothesis of interdependent risks. Particularly, from equation (2): $\lambda_{y_1y_2}|z = 2.11$, $\lambda_{y_1y_3}|z = 1.31$, $\lambda_{y_2y_3}|z = 1.46$ are all statistically significant at 1%.

A useful by-product of the model in Section 2 are the predicted probabilities of experiencing one, two or three risks jointly (p_{ihk}). Hence, for each individual we can estimate 2^3 different probabilities, corresponding to the combination of presence/absence of three dichotomous risks. Table 1 provides a synthetic tools for grading risks, assumed as measures of different levels of vulnerability. It shows mean estimated probabilities over the selected sample and their standard deviations for each vulnerability profile, defined, in the second column, in terms of presence (1) or absence (0) of each of the three risks.

Mean probabilities in Table 1, column 3, can be assumed also as a measure of the (model) predicted incidence of each of eight vulnerability profiles, while categories introduced in column 1 can be used as a criterion for prioritizing interventions. The condition of severe vulnerability refers to a very small amount of individuals who

may be the target for the very first intervention. On the opposite side of our scale, the level of low vulnerability may concern about 15% of individuals and, in this case, less (or no special) aid is presumably needed. Comparing the other different levels of our vulnerability assessment scale, the highest probability is associated with economic deprivation that, controlling for the other two risks, has a mean value of 0.54. Other conditions have probabilities relatively low, not exceeding 10%.

Table 1: Vulnerability scale

Level of Vulnerability	***Isolated-deprived-bad health***	***Mean*** p_{ihk}	***Standard Dev.***	***Min***	***Max***
Severe	111	0.019	0.035	0.000	0.470
High	101	0.018	0.030	0.001	0.336
	110	0.069	0.044	0.001	0.395
	011	0.074	0.111	0.002	0.633
Moderate	100	0.099	0.049	0.003	0.420
	010	0.536	0.172	0.010	0.925
	001	0.031	0.049	0.000	0.339
Low	000	0.154	0.060	0.004	0.434

The upper tail (last decile) of the distribution of p_{111} (the joint probability of experiencing all three risks, i.e. the condition of severe vulnerability) may be assumed as the target population for more urgent policy intervention. In this group about 64% have no international protection; 60.26% have no education and 28.66% have higher education; 78% live in household with 4 or less members; 57.65% has at least one child in the household.

4 Conclusion

Refugees can experience vulnerability in country of origin, while they are on route or in the destination country, which has a responsibility in the infringement of migrants' human rights and on migrant's welfare standards and social inclusion ([1]). In this paper, we propose a new approach for measuring vulnerability of refugees and asylum seekers, by means of the estimated joint effect of three risks they can experience in hosting high-income countries (social isolation, economic deprivation, bad health).

Although international laws recognize all refugees as vulnerable *per se*, an emerging strand of literature argues that once arrived in hosting countries, and assisted by welfare state, not all refugees are still vulnerable (see the Judge Sajo's dissenting opinion [6] against the European Court of Human Rights' qualification of asylum seekers as a particularly underprivileged and vulnerable population *per se*).

Our empirical appraisal to analyse vulnerability allows for partitioning refugees hosted in high income countries, and supported by welfare states, in some selected

subgroups according to their vulnerability profiles. They should be the targeted for early interventions. Even if not considered here for the sake of brevity, it is possible to detect what risk/s is/are more likely to make them more exposed, hence more vulnerable, allowing addressing interventions toward specific hampering conditions. Indeed, factors predicting vulnerability often change depending upon the way in which vulnerability is measured. Scoreboard approaches, ignoring the double counting effect implied by adding highly interdependent factors of risks (such as it is the case for the VAF exercise), may not provide a correct priority ranking of people needing aid.

Our approach can be extended in several directions. First of all, intensity of risk can be modelled by using a set of ordered rather than binary discrete risk indicators. Secondly, residual association can be allowed to depend also on a set of covariates, capturing in this way a sort of "propagation" effect between risk dimensions.

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