Statistical analysis of the correlation between migrant mortality and SAR NGO deployment

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At the request of Forensic Oceanography, I have offered support in the statistical analysis of the relation between the evolution of mortality and the deployment of SAR NGO vessels. I was provided with a variable for the migrant mortality rate (MMR) per month, which is constructed through a measure for migrant's arrivals from UNHCR and one for deaths from IOM for the years 2015 and 2016. I also had a variable for the number of SAR NGO vessels deployed per month, based on data collected by Forensic Oceanography. I constructed an SPSS data file with these two variables (MMR and SAR NGO vessels) and added two additional variables to indicate the month and the year of the respective measurement points. I then ran three correlations:

    (1) SAR NGO vessels * MMR in 2015
    (2) SAR NGO vessels * MMR in 2016
    (3) SAR NGO vessels * MMR in 2015 and 2016

As shown in Table 1, all three results revealed a strong negative correlation (Pearson's R: -.53 (1), -.31 (2), -.22 (3)) indicating that the more SAR NGO vessels were deployed the lower the migrant mortality rate became. However, we are confronted with non-significant results: (1) .08, (2) .32 and (3) .31. This implies that there is a 32%, 31% and an 8% chance respectively that these results cannot be reproduced in other years. However, we have to be aware that we are not dealing here with a sample but that we are approaching a complete population. While we can never be sure about the exact numbers of deaths and arrivals, in statistical terms, this data file comes the closest possible to these numbers. Therefore, the analysis of significance as well as the correlation must be interpreted accordingly. Given that the results are based on a complete dataset for 2015 and 2016 the negative correlation is an empirical fact. In addition, the low significance indicates that these results might be specific for the particular years 2015 and 2016 and there is no empirical evidence that we are able to reproduce the same association for other years. Data for a greater time frame would greatly improve the possibility of evaluating the correlation between the deployment of SAR NGO vessels and the migrant mortality rate. In addition, the availability of additional variables to control for parameters that could influence the relation between the two variables (e.g. weather conditions, vessels from other actors, etc.) could further improve the present results.

In sum, the analysis requested by Forensic Oceanography strongly supports their claim that SAR NGOs played a life-saving role. During the years 2015 and 2016, the deployment of SAR NGO vessels contributed importantly to the reduction of the migrant mortality rate. Only more data will tell us if this relation can be verified for other years. There seems to be little to no theoretical evidence that this should not be the case.

Table 1: Correlations between the deployment of SAR NGO vessels and MMR

	Pearson's R	Sig.	Spearman R	Sig.
SAR NGO vessels * 2015 MMR	-.53	.08	-.41	.18
SAR NGO vessels * 2016 MMR	-.31	.32	-.22	.39
SAR NGO vessels * 2015 + 16 MMR	-.22	.31	-.23	.29