

SARS-CoV-2 pandemic and Construction Industry: insights from Italian data

Matteo Riccò

AUSL – IRCCS di Reggio Emilia, Servizio di Prevenzione e Sicurezza negli ambienti di Lavoro (SPSAL), Reggio Emilia (RE), Italy

To the Editor,

construction industry (CoI) has been severely affected by SARS-CoV-2 pandemic since its onset, as it delayed or even halted construction projects, either directly or indirectly, through interruption of the supply chain, or shortage of workers (1). Moreover, Construction Workers (CW) have been associated with high infection and hospitalization rates (2-3).

Albeit CoI and its workforce globally share several characteristics (e.g. relatively low socio-economic status and education level; high share of migrant workforce and/or ethnic minorities; often inappropriate adherence to up-to-date health and safety standards etc.) (4-5), both are significantly affected by local infrastructures (e.g. roads, hospitals, housing) and safety legislations. Unfortunately, most of available data on SARS-CoV-2 in CoI focus on United States (2-3,6), while more limited evidences from other High-Income Countries (7-9).

In this regard, a retrospective analysis of Italian data may be of certain interest. To begin with, Italy had an early implementation of lockdown measures, i.e. February 2021 (10). Second, following the economic crisis kicked off in 2008 by US subprime housing market, Italian CoI workforce collapsed from 2 million people in 2008, to around 1.3 million in 2019 (4-5); as a consequence, the majority of Italian CW are either self-employed or employed in small sized enterprises (< 10 employees) (5), that are only limitedly able to

cope with the COVID-19 safety requirements (1). Third, the smaller size of enterprises enhances the contacts between employees, that often occur even outside the construction yards (2-3), potentially enhancing the spread of SARS-CoV-2 infection from and within this community. Fourth, nearly all Italian CW are required to fill a mandatory insurance for occupational illness and injuries, and data on compensation claims are regularly provided by the competent National Insurance (INAIL), allowing their retrospective analysis.

According to available data, a total of 176,925 compensation claims for work-related SARS-CoV-2 infections have been reported up to June 30th, 2021 (<https://www.inail.it/cs/internet/comunicazione/covid-19-prodotti-informativi/report-covid-19.html>). Of them, a total of 1,415 occurred in CW (0.8% of total claims), with a cumulative incidence of 1.04 per 1,000 employees, compared to 7.69 per 1,000 employed in other economic sectors. As shown in Figure 1, monthly incidence rate among CW and among the general population were not correlated ($R = -0.45$, $p = 0.097$).

As CoI is traditionally a “male” industry, but official data do not provide accurate information on the demographics of occupational subgroups, we calculated corresponding Risk Ratio (RR) and 95% Confidence Intervals (95%CI) for SARS-CoV-2 compensation claims assuming that (a) substantially all compensated CW were of male gender; (b) the reference group was represented by Italian male workforce. Briefly, RR for

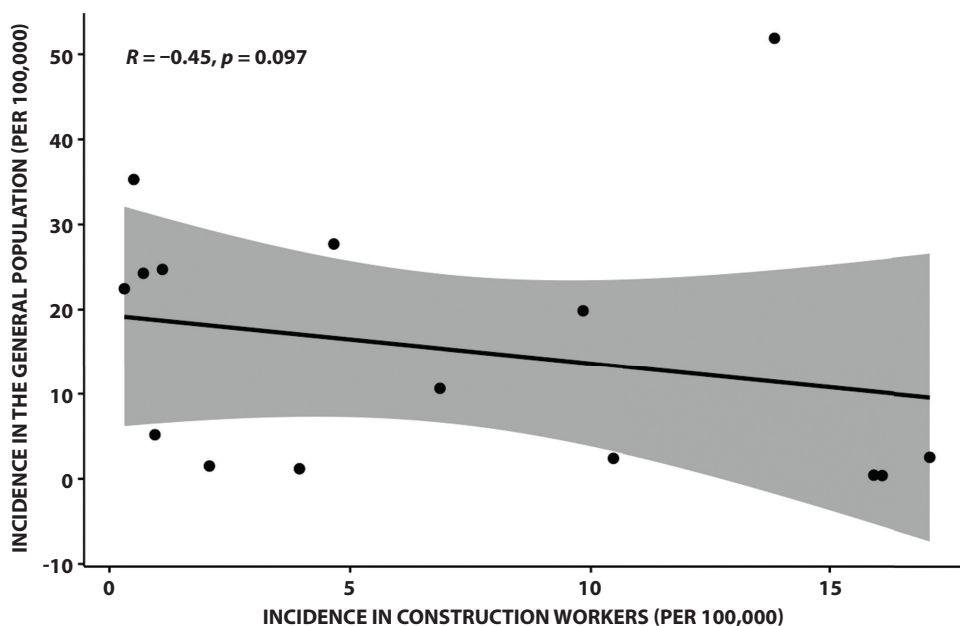


Figure 1. Correlation between monthly incidence rates for SARS-CoV-2 in the general population and among Construction Workers (Italy, April 2020 – June 2021).

CoI (**Figure 2a**) ranged between 0.241 (95%CI 0.204-0.285) in April 2020 and 0.358 (95%CI 0.339-0.377) in June 2021, with a sudden surge after December 2020 i.e. compared to other occupational groups, CW seemly exhibit a substantially lower risk for SARS-CoV-2 compensation claims.

When focusing on SARS-CoV-2 related deaths, a total of 48 compensation claims were retrieved for CoI, from a total of 682 work-related events (7.1%). Corresponding case fatality ratio (CFR) was 3.42% compared to 1.03% in the whole of workers of male gender, with a RR that was equal to 3.287 (95%CI 2.460-4.392) (Figure 2b), confirming a substantially higher risk for a severe outcome in CW compared to other occupational groups.

The relatively low risk for SARS-CoV-2 work-related infection in Italian CW has been originally described by Marinaccio et al. (2020) (8), and several explanations may be suggested.

Firstly, during the first months of the pandemic most of construction yards were halted, with a substantial reduction of active workforce (i.e. around 0.5 million people compared to 1.3 before the lockdown) (2,8). However, raw data suggest that most of

cases occurred well after the lockdown, following the resurgence of SARS-CoV-2 pandemic during the second half of 2020 (i.e. 81.5% of all cases in construction workers were notified since September 1st, 2020). Moreover, Italian Law n. 77/2020 (17 July 2020) has introduced a 110% tax deduction for energy efficiency, anti-seismic interventions and photovoltaic plans that has significantly propelled CoI, with a sustained rebound in active workforce. In this regard, the better performance of CoI during 2021 have presumptively contributed to the increased occurrence of new cases since January 2021. Second, CW mostly work outdoors, and close interactions between CW are not regularly required in the construction yards (1-2,7), reducing the risk for interpersonal spreading of SARS-CoV-2. Third, it is reasonable that the small size of Italian construction enterprises may have created a sort of “bubble” effect, with CW forming a cohesive unit within a single enterprise, that allows individuals to increase their close, physical social interactions while potentially limiting the risk of infection through the exclusivity of the bubble.

The increased CFR for CW compared to other occupational groups may be similarly explained through

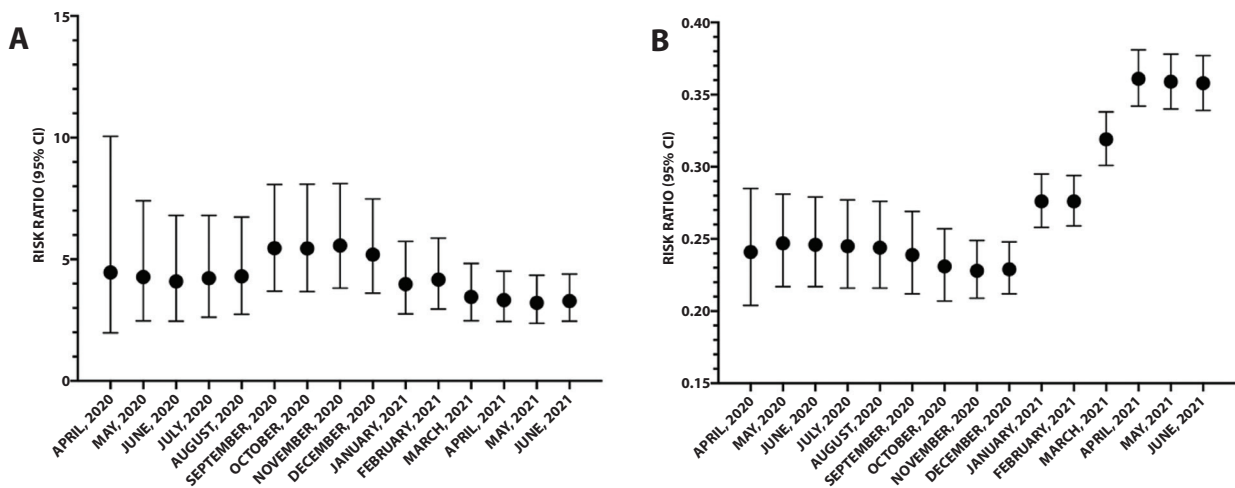


Figure 2. Risk Ratio for compensation claims associated with SARS-CoV-2 infection (a), and for SARS-CoV-2 related deaths (b) in construction workers compared to all other occupational groups (Italy, April 2020 – June 2021).

the specificities of the Italian CoI. While earlier reports hinted towards social deprivation as the main cause of higher hospitalization rates among CW (2-3), Italian CoI is characterized by a very high share of male individuals from older age groups, often reporting well-known risk factor for a worse prognosis of COVID-19 such as smoking, obesity, alcohol consumption, but also pre-existing respiratory disorders associated with the occupational exposure (4-5). In other words, the individual risk factors affecting a significant share of Italian CW may explain their increased risk for a dismal outcome compared to other occupational groups.

Even though our estimates are both highly dependent on the quality of source data and affected by the significant lack of detailed demographic information, they suggest that even though SARS-CoV-2 is simultaneously affecting all workplaces, the course of the ongoing pandemic in occupational settings may be considerably influenced by the specific background and demographics of involved groups. High-quality data from various occupational and geographic settings are therefore required in order to improve our understanding of risk factors and appropriate preventive measures.

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Correspondence:

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Dr. Matteo Riccò,

AUSL-IRCCS di Reggio Emilia

Via Amendola n.2, 42122 Reggio Emilia (RE).

Tel. 0039.3392994343 – 0039.522.837587;

E-mail: matteo.ricco@ausl.re.it / mricco2000@gmail.com