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IMPACT OF THE COVID-19 EPIDEMIC ON THE TOTAL MORTALITY OF THE RESIDENT POPULATION IN THE FIRST QUARTER OF 2020

This Report is produced jointly by Istat and the Istituto Superiore di Sanità (ISS). The aim is to provide an integrated reading of the epidemiological data of the spread of the Covid-19 epidemic and of the total mortality data collected and validated by Istat. The main results are presented at NUT3 level and at aggregation of provinces both referring to administrative level (regions, geographical areas) and referring to three identified classes on the basis of the degree of spread of the covid-19 epidemic in the provinces.

Total mortality data analysed in the report refers to the new Istat press release; today Istat releases data of 6,866 municipalities (out of a total of 7,904, 87%) for which consolidation was possible for the first quarter of 2020 thanks also to the integration of population register sources (ANPR and municipalities) with the data of the Tax Register¹. The large database, relating to 86% of the resident population in Italy, allows to evaluate the effects of the impact of the spread of Covid-19 on mortality by gender and age, taking into account the increases of deaths for all the causes in the initial and fastest period of infection: the month of March 2020.

The Istituto Superiore di Sanità (i.e. the Italian National Institute of Health) by a special decree of the Italian Civil Protection² is responsible for the Italian National integrated Surveillance of cases of Covid-19. The system contains data on all laboratory confirmed cases (i.e., by RT-PCR on nasopharyngeal swabs) of COVID-19 as per the case definition published and regularly updated online by the European Centre for Disease Prevention and Control (ECDC). Data is collected daily using a secure online platform from the 19 regions and two Autonomous Provinces (AP) of the Italian territory³, according to an increasingly harmonized track-record. Data collected includes information on: demographics, clinical severity, comorbidities, date of symptom onset, date of diagnosis, date of death (or recovery), region of diagnosis and municipality of residence. Data here reported are continuously updated and, in agreement with the consolidated availability of daily deaths from ISTAT, analysis of this data refers only to the cases diagnosed within the 31st of March 2020⁴.

¹ For more information on quality and mortality data coverage see the Methodologica Note included in the Report.

² (see link: http://www.protezionecivile.gov.it/amministrazione-trasparente/provvedimenti/dettaglio/-/asset_publisher/default/content/ocdpc-n-640-del-27-febbraio-2020-ulteriori-interventi-urgenti-di-protezione-civile-in-relazione-all-emergenza-relativa-al-rischio-sanitario-connesso-a)

³ Data of the ISS COVID-19 Integrated National Surveillance is not perfectly aligned with the flow of Civil Protection and the Ministry of Health which report aggregated data sent daily by the regions <http://opendatadpc.maps.arcgis.com/apps/opsdashboard/index.html#/b0c68bce2cce478eaac82fe38d4138b1>

⁴ Date of the integrated surveillance database refers to April 26th 2020

SYNTHESIS OF MAIN RESULTS

■ The first autoctonomous diagnosed case in the Italian territory was reported on the February 20th 2020; thereafter, the Italian Covid-19 epidemic has been mainly characterized by a local transmission; since the beginning of the epidemic several preventive measures to favour “social distancing” were undertaken, initially at the local level and finally at the national level with a lockdown of the entire territory on the March 11th 2020.

■ Geographical spread has been heterogeneous with a substantial gradient at the latitude levels with the highest spread in the Northern regions and the lowest in the Southern regions and in the main Islands.

■ Although local and national preventive measures started since the end of February, the epi-curves of diagnosed cases and deaths continued to grow until the last week of March 2020.

■ Cases were more common among women (52.7%) mainly among the elderly population. Among people aged 90 years old or more women accounted for about 3 out of 4 cases. The median age at Covid-19 diagnosis was 62 years old.

■ With the exception of 0-19 age class, men had higher letality compared to women in each five age class. Around 35% of reported Covid-19 cases had at least one diagnosed co-morbidity reported (cardiovascular, respiratory, diabetes, immune system deficit, metabolic, cancer, renal co-morbidities).

■ Among the 14,324 reported deaths within the 31st of March, in this analysis 13,710 (96%) were included; those excluded did not report the municipality of residence or referred to municipalities not included in the ISTAT selection.

■ Considering the month of March, the average national level shows an increase in deaths due to the total causes of 49.4%. If we take as a reference the period from the first Covid-19 death reported by the Covid-19 Integrated Surveillance System (20 February) until March 31st, deaths increase from 65,592 (average period 2015-2019) to 90,946, in 2020. The excess of the deaths is 25,354 units, 54% of these are Covid-19 diagnosed deaths (13,710). Because of the strong concentration of the phenomenon in some areas of the country, data referring to the average national level “flatten” the size of the impact of the Covid-19 epidemic on total mortality.

■ 91% of the excess mortality registered at the average national level in March 2020 is concentrated in the areas of high spread of the epidemic: 3,271 municipalities, 37 Northern provinces plus Pesaro and Urbino. In all of these provinces, deaths from all causes have more than doubled compared to the 2015-2019 average for the month of March. If we consider the period from February 20th to March 31st, deaths have risen from: 26,218 to 49,351 (+ 23,133); just over the half of this increase (52%) are deaths reported by the Covid-19 Integrated Surveillance System (12,156). Within this group, the most affected provinces by the epidemic recorded three-digit percentage increase of deaths in March 2020, compared to 2015-2019 average: Bergamo (568%), Cremona (391%), Lodi (371%), Brescia (291%), Piacenza (264%), Parma (208%), Lecco (174%), Pavia (133%), Mantua (122%), Pesaro and Urbino (120%).

■ In the areas with medium spread of epidemic (1,778 municipalities, 35 provinces mainly located in the Center-North), deaths increase due to the total causes in the period from February 20th to March 31st is much more contained: from 17,317 to 19,743 (2,426 more than the 2015-2019 average); 47% are attributed to Covid-19 positive deaths (1,151). Finally, in the areas with a low spread of epidemic (1,817 municipalities, 34 provinces mostly located in the Center and in the South), deaths of the month of March 2020 are on average 1.8% lower than that of the last five years.

- The most important excess mortality regards men aged 70-79 whose deaths increase by about 2.3 times between February 20th and March 31st, followed by the 80-89 age group (almost increased 2.2 times). The increase in female mortality is more reduced for all age groups. At the end of Mar it is 20% more than the average of the years 2015-2019 both for the 70-79 and the 90 and more age groups.
- The combined analysis of ISTAT daily mortality data with the ISS Covid-19 Integrated Surveillance System data showed that the "direct" mortality attributed to COVID-19 in individuals with confirmed diagnosis, was in the first quarter of 2020 of about 13,700 deaths.
- There is an additional amount of about 11,600 deaths for which three possible effects can be hypothesized on the basis of mortality data currently available. There is an additional direct effect of Covid-19 (consisting of deaths of non-tested people), an indirect effect of the virus (such as organ dysfunction as a consequence of viral infection resulting in cardiovascular or other cause-specific mortality, as observed also in influenza outbreaks). Lastly the quota of mortality not directly related to the virus but resulting from the excessive stress of the health system especially in more affected areas.
- In areas of high spread, since the beginning of March 2020, the daily number of deaths for Covid-19 exceeds the number of deaths observed in 2017 for conditions such as diabetes, dementias and Alzheimer's disease. Halfway through the month Covid-19 deaths overcomes the deaths due to respiratory conditions and neoplasms; in less than 20 days deaths for Covid-19 exceeds daily overall mortality of 2017. The analysis of the complete cause-of-death data for 2020, will provide information on the fraction of mortality attributable to deaths of non-tested cases with clinical diagnoses only (currently not recorded by surveillance), to the indirect effects of Covid-19 and the mortality quota not related to the epidemic.

Press Office Istat

ufficiostampa@istat.it

Press Office ISS

ufficio.stampa@iss.it

tel. +39.06.4990.6601