

Supplementary Table S1.

OBSERVANT Research Group

Fulvia Seccareccia, Paola D'Errigo, Stefano Rosato, Alice Maraschini, Gabriella Badoni, **Istituto Superiore di Sanità**

Corrado Tamburino, Marco Barbanti, **SICI-GISE**

Gennaro Santoro, FIC, **ANMCO**

Marco Ranucci, **ITACTA**

Danilo Fusco, **Epidemiology Dept. Lazio Region**

Rossana De Palma, **Emilia Romagna Region**

Salvatore Scondotto, **Sicilia Region**

Participating haemodynamic centres

1. Città della Salute e della Scienza – A.O.U. Molinette – San Giovanni Battista di Torino, Torino. Marra S., Marra S., D'Amico M.
2. Città della Salute e della Scienza – A.O.U. Molinette – San Giovanni Battista di Torino, Torino. Gaita F., Moretti C.
3. Ospedale Mauriziano “Umberto I”, Torino. De Benedictis M., Aranzulla T.
4. A.O. Nazionale Ss. Antonio e Biagio e Cesare Arrigo, Alessandria. Pistis G., Reale M.
5. Istituto Clinico S.Ambrogio, Milano. Bedogni F., Brambilla N.
6. Fondazione IRCSS Policlinico San Matteo, Pavia. Ferrario M., Ferrero L., Vicinelli P.
7. Fondazione San Raffaele del Monte Tabor, Milano. Colombo A., Chieffo A., Ferrari A.
8. I.R.C.C.S. Policlinico San Donato, San Donato M.se (MI). Inglese L., Casilli F.
9. Spedali Civili di Brescia - Università, Brescia. Etori F., Frontini M.
10. Ospedale Luigi Sacco – A.O. – Polo Universitario, Milano. Antona C., Piccaluga E.
11. A.O. Ospedale Niguarda Cà Granda, Milano. Klugmann S., De Marco F.
12. A.O. Bolognini Seriate, Seriate (BG). Tespili M., Saino A.
13. Fondazione Poliambulanza Istituto Ospedaliero, Brescia. Leonzi O., Rizzi A.
14. Ospedale “S. Maria di Ca’ Foncello”, Treviso. Franceschini Grisolia E., Franceschini Grisolia E.
15. A.O. di Padova, Padova. Isabella G., Fraccaro C.
16. A.O.U. Santa Maria Della Misericordia di Udine, Udine. Bernardi G., Bisceglia T., Armellini I.
17. A.O.U. San Martino, Genova. Vischi M., Parodi E.
18. A.O.U. di Parma, Parma. Vignali L., Ardissimo D.
19. Policlinico S Orsola Malpighi, Bologna. Marzocchi A., Marrozzini C.
20. Maria Cecilia Hospital, Ravenna. Cremonesi A., Colombo F.
21. A.O.U. Pisana, Pisa. Petronio S., Giannini C.
22. A.O.U. Senese Le Scotte, Siena. Pierli C., Iadanza A.
23. A.O.U. Careggi, Firenze. Santoro G., Meucci F.
24. Ospedale del Cuore Fondazione CNR Regione Toscana G. Monasterio, Massa. Berti S., Mariani M.
25. European Hospital, Roma. Tomai F., Ghini A.
26. A.O. S Camillo-Forlanini, Roma. Violini R., Confessore P.
27. Policlinico Gemelli Cardiologia, Roma. Crea F., Giubilato S.
28. Policlinico Umberto I, Roma. Sardella G., Mancone M.
29. A.O.U. Integrata Verona, Verona. Ribichini F., Vassanelli C., Dandale R.
30. A.O.OO.RR.S. Giovanni di Dio e Ruggi d`Aragona - A.O.U. di Salerno, Salerno. Giudice P., Vigorito F.
31. Casa Di Cura Città Di Lecce Srl, Lecce. Liso A., Specchia L.
32. A.O.U. Mater Domini, Catanzaro. Indolfi C., Spaccarotella C.
33. A.R.N.A.S. Ospedale Civico – Di Cristina – Benfratelli, Palermo. Stabile A., Gandolfo C.
34. A.O.U. “Policlinico – Vittorio Emanuele” – Ospedale Ferrarotto, Catania. Tamburino C., Ussia G.

Participating cardiac surgery centres

1. Villa Maria Pia Hospital Gruppo Villa Maria Cardiochirurgia, Torino. Comoglio C., Dyrda O.
2. Città della Salute e della Scienza – A.O.U. Molinette – San Giovanni Battista di Torino, Torino. Rinaldi M., Salizzoni S.
3. Azienda Ospedaliera Universitaria Maggiore della Carità, Novara. Micalizzi E.
4. A.O. S. Croce e Carle, Cuneo. Grossi C., Di Gregorio O.
5. A.O. Nazionale Ss. Antonio e Biagio e Cesare Arrigo, Alessandria. Scoti P., Costa R.
6. Ospedale Mauriziano “Umberto I”, Torino. Casabona R., Del Ponte S.

Supplementary Table SI. Cont

7. Istituto Clinico S. Ambrogio, Milano. Panisi P., Spira G.
8. Fondazione Poliambulanza Istituto Ospedaliero, Brescia. Troise G., Messina A.
9. Fondazione I.R.C.S.S. Policlinico San Matteo, Pavia. Viganò M., Aiello M.
10. Fondazione San Raffaele del Monte Tabor, Milano. Alfieri O., Denti P.
11. I.R.C.C.S. Policlinico San Donato, San Donato M.se (MI). Menicanti L., Agnelli B.
12. IRCCS Multimedica, Milano. Donatelli F.
13. Spedali Civili di Brescia – Università, Brescia. Muneretto C., Frontini M.
14. Spedali Civili di Brescia – Università, Brescia. Rambaldini M., Frontini M.
15. A.O. Ospedale di Lecco – Presidio Alessandro Manzoni, Lecco. Gamba A., Tasca G.
16. Ospedali Riuniti di Bergamo – A.O., Bergamo. Ferrazzi P., Terzi A.
17. Ospedale Luigi Sacco – A.O. – Polo Universitario, Milano. Antona C., Gelpi G.
18. A.O. Ospedale Niguarda Cà Granda, Milano. Martinelli L., Bruschi G.
19. Presidio Ospedaliero S.Chiara – Ospedale di Trento, Trento. Graffigna A.C.
20. A.O.U. Integrata Verona, Verona. Mazzucco A.
21. A.O.U. Ospedali Riuniti di Trieste – Ospedale di Cattinara, Trieste. Pappalardo A., Gatti G.
22. A.O.U. Santa Maria Della Misericordia di Udine, Udine. Livi U., Pompei E.
23. ICLAS - Istituto Clinico Ligure di Alta Specialità, Rapallo (GE). Coppola R., Gucciardo M.
24. A.O.U. San Martino, Genova. Passerone G., Parodi E.
25. Salus Hospital spa, Reggio Emilia. Albertini A., Caprili L.
26. Hesperia Hospital Modena S.r.l., Modena. Ghidoni I., Gabbieri D.
27. Maria Cecilia Hospital, Ravenna. La Marra M., Aquino T.
28. Azienda Ospedaliero – Universitaria di Parma, Parma. Gherli T.
29. Policlinico S. Orsola Malpighi, Bologna. Di Bartolomeo R., Savini C.
30. Villa Maria Beatrice Hospital, Firenze. Popoff G., Innocenti D.
31. A.O.U. Pisana, Pisa. Bortolotti U., Pratali S.
32. A.O.U. Careggi, Firenze. Stefano P., Blanzola C.
33. Ospedale del Cuore Fondazione CNR Regione Toscana G. Monasterio, Massa. Glauber M., Cerillo A., Chiaramonti F.
34. A.O. Santa Maria, Terni. Pardini A., Fioriello F.
35. A.O. G. M. Lancisi, Ancona. Torracca L., Rescigno G.
36. European Hospital, Roma. De Paulis R., Nardella S.
37. A.O. S Camillo-Forlanini, Roma. Musumeci F., Luzi G.
38. Policlinico Gemelli, Roma. Possati G., Bonalumi G.
39. Università Campus Bio-Medico di Roma, Roma. Covino E., Pollari F.
40. A.O. Sant'Andrea, Roma. Sinatra R., Roscitano A.
41. Policlinico Tor Vergata, Roma. Chiariello L., Nardi P.
42. Clinica San Michele, Maddaloni (CS). Lonobile T., Baldascino F.
43. A.O.OO.RR.S. Giovanni di Dio e Ruggi d`Aragona – A.O.U. di Salerno, Salerno. Di Benedetto G., Mastrogiovanni G.
44. A.O. San Sebastiano, Caserta. Piazza L., Marmo J.
45. A.O.U. Federico II, Napoli. Vosa C., De Amicis V.
46. Anthea Hospital, Bari. Speciale G., Visicchio G., Spirito R.
47. Casa Di Cura Citta Di Lecce Srl, Lecce. Gregorini R., Specchia L.
48. Azienda Sanitaria Locale Le Fazzi Presidio Ospedaliero Vito Fazzi, Lecce. Villani M., Pano M.A.
49. A.O.U. Consorziale Policlinico di Bari, Bari. Bortone A., De Luca Tupputi Schinosa L., De Cillis E.
50. Azienda Ospedaliera Regionale San Carlo, Potenza. Gaeta R., Di Natale M.
51. S. Anna Hospital, Catanzaro. Cassese M., Antonazzo A.
52. Villa Maria Eleonora Hospital, Palermo. Argano V., Santaniello E.
53. Centro Cuore Morgagni, Pedara (CT). Patanè L., Gentile M., Tribastone S.
54. A.R.N.A.S. Ospedale Civico – Di Cristina – Benfratelli, Palermo. Follis F., Montalbano G.
55. IS.ME.T.T. (Istituto Mediterraneo per i Trapianti e Terapie ad Alta Specializzazione), Palermo. Pilato M., Stringi V.
56. A.O. Ospedali Riuniti Papardo – Piemonte, Messina. Patanè F., Salamone G.
57. A.O.U. Policlinico Paolo Giaccone, Palermo. Ruvolo G., Pisano C.
58. A.O.U. “Policlinico – Vittorio Emanuele” – Ospedale Ferrarotto, Catania. Mignosa C., Bivona A.
59. A.O. Brotzu, Cagliari. Cirio E.M., Lixi G.

Supplementary Table SII. The RECORD statement – checklist of items, extended from the STROBE statement

Variable	Item No.	STROBE items and recommendation ⁹	Location in manuscript where items are reported (page no.)	RECORD items and recommendation ¹	Location in manuscript where items are reported (page no.)
Title and abstract					
	1	(a) Indicate the study's design with a commonly used term in the title or the abstract. (b) Provide in the abstract an informative and balanced summary of what was done and what was found.	1, 2 2	RECORD 1.1: The type of data used should be specified in the title or abstract. When possible, the name of the databases used should be included. RECORD 1.2: If applicable, the geographic region and timeframe within which the study took place should be reported in the title or abstract. RECORD 1.3: If linkage between databases was conducted for the study, this should be clearly stated in the title or abstract.	1, 2 – 2
Introduction					
Background rationale	2	Explain the scientific background and rationale for the investigation being reported.	3		3
Objectives	3	State specific objectives, including any prespecified hypotheses.	3		3
Methods					
Study design	4	Present key elements of study design early in the paper.	3, 4		
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection.	4, 5		
Participants	6	(a) <i>Cohort study</i> – Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up. <i>Case-control study</i> – Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls. <i>Cross-sectional study</i> – Give the eligibility criteria, and the sources and methods of selection of participants. (b) <i>Cohort study</i> – For matched studies, give matching criteria and number of exposed and unexposed. <i>Case-control study</i> – For matched studies, give matching criteria and the number of controls per case.	4, 5 Supplementary Figure S1	RECORD 6.1: The methods of study population selection (such as codes or algorithms used to identify subjects) should be listed in detail. If this is not possible, an explanation should be provided. RECORD 6.2: Any validation studies of the codes or algorithms used to select the population should be referenced. If validation was conducted for this study and not published elsewhere, detailed methods and results should be provided. RECORD 6.3: If the study involved linkage of databases, consider use of a flow diagram or other graphical display to demonstrate the data linkage process, including the number of individuals with linked data at each stage.	3, 4 Supplementary Figure S1

Supplementary Table SII. Cont.

Variable	Item No.	STROBE items and recommendation ⁹	Location in manuscript where items are reported (page no.)	RECORD items and recommendation ¹	Location in manuscript where items are reported (page no.)
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.	4	RECORD 7.1: A complete list of codes and algorithms used to classify exposures, outcomes, confounders, and effect modifiers should be provided. If these cannot be reported, an explanation should be provided.	3, 4
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group.	4, 5		
Bias	9	Describe any efforts to address potential sources of bias.	5		
Study size	10	Explain how the study size was arrived at.	4, 5 Supplementary Figure S1		
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen, and why.	4, 5		
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding. (b) Describe any methods used to examine subgroups and interactions. (c) Explain how missing data were addressed. (d) <i>Cohort study</i> – If applicable, explain how loss to follow-up was addressed. <i>Case-control study</i> – If applicable, explain how matching of cases and controls was addressed. <i>Cross-sectional study</i> – If applicable, describe analytical methods taking account of sampling strategy. (e) Describe any sensitivity analyses.	5		
Data access and cleaning methods				RECORD 12.1: Authors should describe the extent to which the investigators had access to the database population used to create the study population. RECORD 12.2: Authors should provide information on the data cleaning methods used in the study.	4, 5

Supplementary Table SII. Cont.

Variable	Item No.	STROBE items and recommendation ^a	Location in manuscript where items are reported (page no.)	RECORD items and recommendation ^b	Location in manuscript where items are reported (page no.)
Linkage		–		RECORD 12.3: State whether the study included person-level, institutional-level, or other data linkage across two or more databases. The methods of linkage and methods of linkage quality evaluation should be provided.	4
Results					
Participants	13	(a) Report the numbers of individuals at each stage of the study (e.g., numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed). (b) Give reasons for non-participation at each stage. (c) Consider use of a flow diagram.	5	RECORD 13.1: Describe in detail the selection of the persons included in the study (i.e., study population selection) including filtering based on data quality, data availability and linkage. The selection of included persons can be described in the text and/or by means of the study flow diagram.	5
Descriptive data	14	(a) Give characteristics of study participants (e.g., demographic, clinical, social) and information on exposures and potential confounders. (b) Indicate the number of participants with missing data for each variable of interest. (c) <i>Cohort study</i> – summarise follow-up time (e.g., average and total amount).	5 Table I		
Outcome data	15	<i>Cohort study</i> – Report numbers of outcome events or summary measures over time. <i>Case-control study</i> – Report numbers in each exposure category, or summary measures of exposure. <i>Cross-sectional study</i> – Report numbers of outcome events or summary measures.	5 Table II Figure 1		
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included. (b) Report category boundaries when continuous variables were categorized. (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period.	5 Table II Figure 1		

Supplementary Table SII. Cont.

Variable	Item No.	STROBE items and recommendation ⁹	Location in manuscript where items are reported (page no.)	RECORD items and recommendation ¹	Location in manuscript where items are reported (page no.)
Other analyses	17	Report other analyses done – e.g., analyses of subgroups and interactions, and sensitivity analyses.	–		
Discussion					
Key results	18	Summarise key results with reference to study objectives.	6		
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias.	7	RECORD 19.1: Discuss the implications of using data that were not created or collected to answer the specific research question(s). Include discussion of misclassification bias, unmeasured confounding, missing data, and changing eligibility over time, as they pertain to the study being reported.	6, 7
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence.	6, 7		
Generalisability	21	Discuss the generalisability (external validity) of the study results.	7		
Other information					
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based.	7		
Accessibility of protocol, raw data, and programming code				RECORD 22.1: Authors should provide information on how to access any supplemental information such as the study protocol, raw data, or programming code.	3, 4 Supplemental Material