






Inequalities in screening policies and perioperative protection for patients with acute appendicitis during the pandemic: Subanalysis of the ACIE Appy study

G. Pellino ^{1,2,*}, M. Podda ³, F. Pata ^{4,5}, S. Di Saverio ⁶ and B. Ielpo ⁷, on behalf of the ACIE Appy Study Collaborative

¹Department of Advanced Medical and Surgical Sciences, Università degli Studi della Campania 'Luigi Vanvitelli', Naples, Italy

²Colorectal Surgery, Vall d'Hebron University Hospital, Barcelona, Spain

³Department of General and Emergency Surgery, Cagliari University Hospital, Cagliari, Italy

⁴General Surgery Unit, Nicola Giannettasio Hospital, Corigliano-Rossano, Italy

⁵La Sapienza University, Rome, Italy

⁶ASUR Marche 5, San Benedetto del Tronto General Hospital, University Hospital of Varese, ASST Sette Laghi, Regione Lombardia, Varese, Italy

⁷Department of Surgery, HPB Unit, Hospital del Mar - Parc de Salut MAR, University Pompeu Fabra, Barcelona, Spain

*Correspondence to: Department of Advanced Medical and Surgical Sciences, Università degli Studi della Campania 'Luigi Vanvitelli', Naples, Italy; Colorectal Unit, University Hospital Vall d'Hebron, Barcelona, Spain (e-mail: gipe1984@gmail.com; @GianlucaPellino, @ACIEuro)

Members of the ACIE Appy Study Collaborative are co-authors of this study and are listed under the heading Collaborators.

Dear Editor

Acute appendicitis remains a common reason for hospital admission. Reports have suggested a reduction in patients attending emergency departments during the acute phase of the SARS-CoV-2 pandemic. Moreover, a global surge in conservative management of acute appendicitis has recently been registered by the Appy Study of the Association of Italian Surgeons in Europe (ACIE)¹. This is a treatment option that has been known for some years, although quite seldom used before the pandemic^{2–4}.

As most countries are experiencing new waves of the pandemic, the attitude of surgeons towards SARS-CoV-2 screening policies and personal protective equipment (PPE) used during the management of patients with acute appendicitis need to be established.

According to a subanalysis of the ACIE Appy Study, half of surgeons globally were testing patients for SARS-CoV-2 only when symptomatic or there was suspicion of infection; approximately 12 per cent did not test patients at all (Fig. 1 and Table S1). There were regional differences. In Europe, respondents tested all patients (50.8 per cent) or those with suspected infection (43.9 per cent), with only 5.3 per cent not being tested at all. In the USA, the majority of participants only tested patients with a suspected infection (65.6 per cent). A similar picture of testing only those with a suspected infection was also reported from Latin America (57.2 per cent), Asia/Middle East (76.8 per cent), and Africa (41.7 per cent). Even more worrisome, 58.3 per cent of respondents from Africa and 27.6 per cent from Latin America were not testing patients at all before appendicectomy.

Concerning the screening modality, most respondents used PCR alone or in combination with chest imaging. Serology was rarely used overall and never in Africa (Fig. 1 and Table S2). It is now accepted that chest imaging is not routinely required and that PCR is an accurate screening modality. Serology might,

however, be useful to shed light on the disease course and previous exposure to the virus, but respondents from some countries still have restricted access to this test.

In terms of PPE during appendicectomy, most African respondents did not use different PPE compared with the prepandemic period in patients who tested negative for COVID-19. More concerning is that 58.3 per cent did not use different PPE in untested patients. This differed from other regions where the rate of those not considering a change of PPE in untested patients did not exceed 22 per cent. One in 10 respondents from Latin America also reported that they were not using different PPE compared with the prepandemic phase in patients who tested positive for COVID-19.

These data, and taking into account the high prevalence of acute appendicitis, leads to the conclusion that omission of routine patient screening may have contributed to local clusters among patients and threatened the safety of healthcare workers⁵. In this respect, it is likely that limited access to PPE explains the attitude of surgeons towards patients with unknown SARS-CoV-2 status or those infected, raising ethical concerns about the safety of surgical staff. It is of utmost importance that, even during challenging times and stress on economic stability, industrialized countries make efforts to sustain low-income countries and those with limited resources. This would ensure equal working conditions, safer treatment for patients with acute appendicitis, and better control of the pandemic.

Collaborators

Steering and Writing Committee of Appy Study: B. Ielpo, M. Podda, G. Pellino, F. Pata, R. Caruso, G. Gravante, S. Di Saverio. Participants: A. Oreglia, A. Chowdary, A. Kulkarni, A. Kuvvetli, A. Navarro, A. Smith, A. Cavero Ibiricu, A. J. D. Nacion, A. Alsaleh, A.

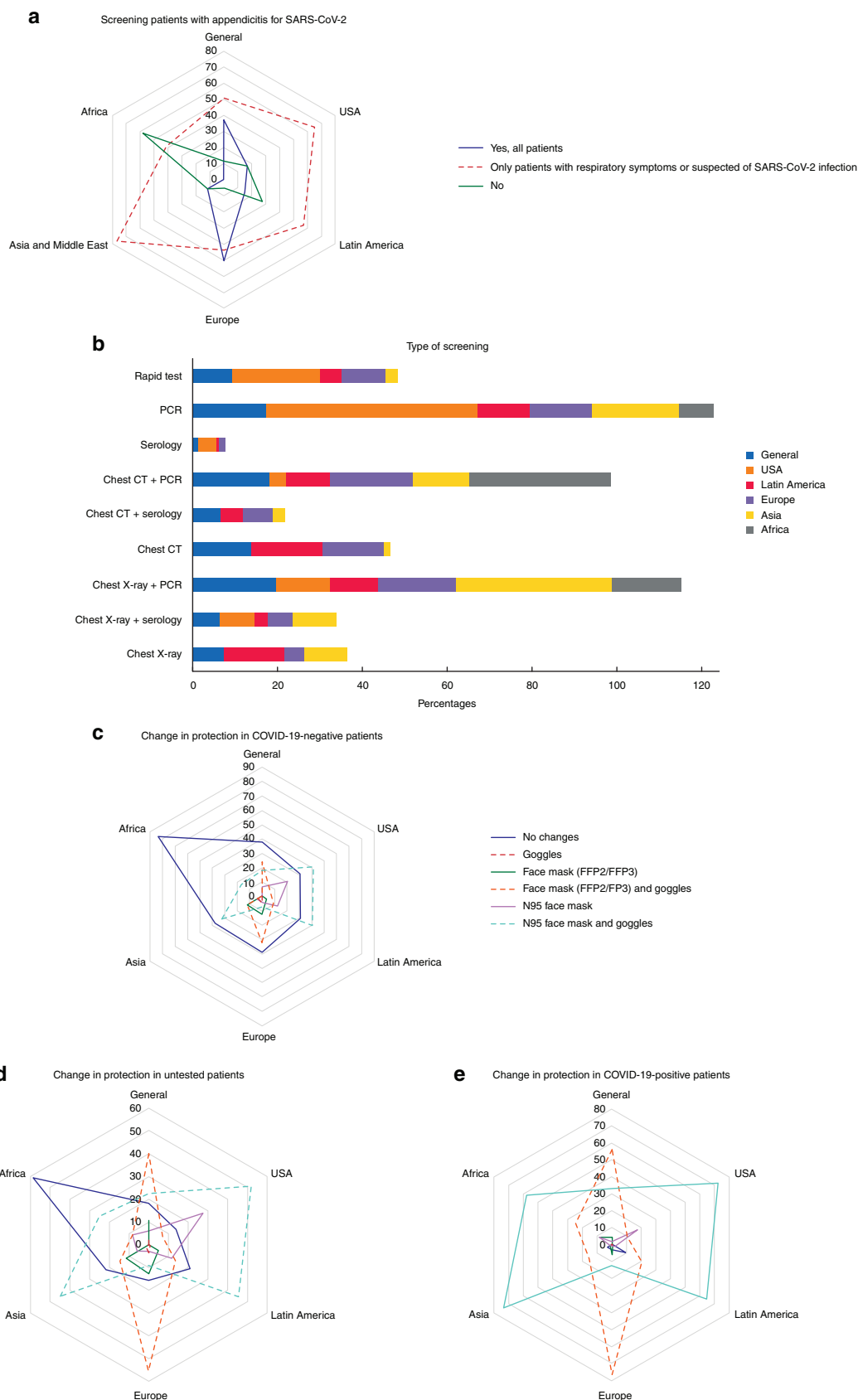


Fig. 1 Screening policies and use of personal protective equipment during the pandemic in ACIE Appy Study¹ percentages of each item, **a** Screening policies in patients with acute appendicitis in different geographical regions. **b** Screening modalities used in different geographical regions. **c-d** Changes in the use of personal protective equipment during the pandemic, in **c** patients testing negative for COVID-19, **d** patients not tested for COVID-19, and **e** patients testing positive for COVID-19 in different geographical regions.

- Alhazmi, A. Elmabri, A. Wani, A. Rencuzogullari, A. Sarriugarte Lasarte, A. Valle Rubio, A. Bavikatte, A. Kumar, A.-R. Jamiri, A. M. Alvarado Padilla, A. Cacurri, A. de San Ildefonso, A. Porcu, A. Sartori, A. Rocca, A. Paz Yáñez, A. Becaria, A. Solís-Peña, A. Sretenović, A. Urbistondo, A. Bandin, A. Najar, A. De Luca, A. Boddy, A. Charalabopoulos, A. Tzivanakis, A. Amendola, A. Ramirez-Gutierrez de Velasco, A. Cihat Yildirim, A. Frontali, A. O. Toure, A. García-Granero, A. Martínez Roldan, A. Sanz Larrainzar, A. Sanjiva Ratnayake, A. M. Gonzalez-Ganso, A. M. Minaya-Bravo, A. Das, A. Bondurri, A. Costanzi, A. Lucchi, A. Mazzari, A. Musig, A. Peloso, A. Piano, A. Police, A. Mihailescu, A. Pouy, A. Romano, A. Iossa, A. C. Leonetti, A. Guariniello, A. Isaac, A. P. Delli Bovi, A. Chessa, A. Tromba, A. Álvarez Martínez, A. Brillantino, A. Caira, A. Castaldi, A. Ferronetti, A. Giuliani, A. Prester, A. Ramos-De la Medina, A. Tarasconi, A. Tornabelli, A. Picciariello, A. Ioannidis, A. Leppäniemi, A. Khan, A. Rashid, A. L. E. Pérez-Sánchez, A. Mittal, A. Rahman Mitul, A. Mehraj, A. Laharwal, A. Dorismé, A. Marinis, A. Iqbal, A. Moncada, B. Braccio, B. Alkhafaji, B. de Andrés Asenjo, B. Martin-Perez, B. De Simone, B. Sánchez Pérez, B. Creavin, B. Cali, B. Pascotto, B. Stubbs, B. Zavala Retes, B. Jovanovic, B. K. P. Goh, B. Sensi, C. Biddau, C. Gazia, C. Vallicelli, C. A. Fagundes, C. Cerdán Santacruz, C. Chirico, C. J. Gómez Díaz, C. Petrola, C. Sánchez Rodríguez, C. Yáñez Benítez, C. Dammaro, C. Lo Faro, C. Reinke, C. Dominguez Paez, C. Oliva, C. Paranjape, C. Thomas, C. Fung Chia, C. Kwan Kong, C. De Lucia, C. Ovalle Chao, C. Arcudi, C. Guerci, C. Chia, C. Parise, C. Folliero, C. Varela, D. M. Ferguson, D. Camacho, D. Popowich, D. Souza Lima, D. Rega, D. Delogu, D. Zigiotta, D. Vinci, D. D'Antonio, D. Parini, D. A. Merlini, D. D. E. Zimmerman, D. Moro-Valdezate, D. Pertile, D. M. Giusti, D. S. Keller, D. Tarik, D. Kalivaçi, D. Mazingi, D. G. Maldonado-Pintado, D. Sasia, D. Linardoutsos, D. Osilli, D. Murrone, D. Russello, E. Rodas, E. A. Acuña Roa, E. Ricciardi, E. Rosso, E. Saladino, E. Flores-Villalba, E. Ruiz Ajs, E. Smith-Singares, E. Baili, E. Kouroumpas, E. Bourmpouteli, E. Douka, E. Martin-Perez, E. Guaitoli, E. Samadov, E. Francone, E. Vaterlini, E. Morales, E. Peña, E. Zhao, E. Del Pozo Andres, E. Benzoni, E. Erdas, E. Pinotti, E. Colás-Ruiz, E. Aytac, E. Laterza, E. Agastra, E. Foianini, E. Moscoso, E. Laviano, E. Marra, E. Cardamone, E. Licardie, E. Mpaili, E. Pinna, E. Varo, F. M. Navarro, F. Marino, F. Medas, F. Romano, F. Maraska, F. Saliu, F. Madrid, F. Rosa, F. Mastella, F. Gheza, F. Luvisetto, F. Alconchel, F. Monge Vieira, F. Pareja, F. Agresta, F. Luna, F. Bonilla, F. Cordera, F. Burdió, F. Mendoza-Moreno, F. Muñoz Flores, F. Pardo Aranda, F. Taylor, F. L. Ramos, F. Fernandes, F. P. Tropeano, F. Balestra, F. Bianco, F. Ceci, F. Colombo, F. Di Marzo, F. Ferrara, F. Lancellotti, F. Lazzarin, F. Litta, F. Martini, F. Pizza, F. Roscio, F. Viridis, F. Blanco Antona, F. Cervantes Ramírez, F. M. Fernandez, F. O. Llinares, F. Quezada, F. Schlottmann, F. Quezada, G. Herrera-Almario, G. Massaferrero, G. Bislenghi, G. van Ramshorst, G. Gallo, G. Luglio, G. Bointas, G. Kampouroglou, G. Papadopoulos, G. Arredondo Manrique, G. Calini, G. Natri, G. Formisano, G. Galiffa, G. M. Palini, G. Colucci, G. Pagano, G. Pellino, G. Vanni, G. Casoni Pattacini, G. Gravante, G. De Paola, G. Lisi, G. Partida, G. Bellanova, G. De Nobili, G. Sammy Necchi, G. Sinibaldi, G. Tebala, G. Bagolini, G. Izzo, G. Argenio, G. Brisinda, G. Candilio, G. Di Grezia, G. E. Sposito, G. Faillace, G. Frazzetta, G. La Gumina, G. Nigri, G. Romeo, G. Chocarro Amatriaín, G. Ortega, G. Martin-Martín, G. A. Stavrou, Gunadi, G. Armand Ugon, G. Machain, G. Marcucci, G. Martínez-Mier, G. M. Machain, G. Nari, H. Calvo, H. Fathy, Hamilton, H. Ahmed, H. Faraj, H. Nava, H. Ordas Macias, H. Nikaj, H. Solano, H. Ahmed Khan, H. Sánchez Alarcón, H. Ebied, I. Giani, I. Villalabeitia Ateca, I. Neri, I. A. San Roman, I. Fidoshev, I. Martinez Rodríguez, I. Negoj, I. Ortega, I. Bernescu, I. Shari Russo, I. Vincente Rodríguez, I. Palomares, I. Baltazar, I. Jaén Torrejimenó, I. M. Cornejo Jurado, I. Reccia, I. Hussain, I. Brito Toledo, I. Mora-Guzmán, I. al-Najami, I. Dogaru, I. Romic, I. Balciscueta, J. C. Kenington, J. Sagolsem, J. Y. Jang, J. Olivier, J. Lammel-Lindemann, J. Dziakova, J. I. Roldán Villavicencio, J. Salinas, J. Pejanovic, J. G. Parreira, B. Jovanovic, J. Rincón Pérez, J. A. S. Reyes, J. A. Medina Luque, J. Mak, J. Salas Rodriguez, J. H. Herrera Kok, J. Krook, J. A. Diaz-Elizondo, J. Castell, J. Eduardo García-Flores, J. M. Jover Navalón, J. M. Silva Rodrigues, J. Pereira Pinto, J. T. Castell Gómez, J. Bellido Luque, J. C. Martín del Olmo, J. C. Salamea, J. F. Coronel Olivier, J. L. Blas Laina, J. M. Ordoñez, J. Gutierrez, J. Abba, J. Ahmad Sofi, K. Sherafgan, K. Sahnan, K. Yanaga, K. Beatson, L. Asim, L. Alvarez, L. Siragusa, L. Farber, L. Ong, L. Athanasios, L. García-Bruña, L. De Martino, L. Ferrario, L. Giordano, L. Gordini, L. Pio, L. Ponchiatti, L. Moleta, L. Curella, L. Poggi, L. Taglietti, L. Bonavina, L. Conti, L. Goffredi, L. A. Garcia Ruiz, L. Barrionuevo, L. E. Fregoso, L. F. Cabrera, L. G. Rodriguez, L. Grande, L. G. Osoria, L. J. Kantun Gonzalez, L. Sánchez-Guillén, L. Tallon-Aguilar, L. Tresierra, L. Giavarini, M. Hasabelnabi, M. Odovic, M. Uemura, M. Khan, M. Artilles-Armas, M. David, M. Di Martino, M. G. Spampinato, M. A. F. Ribeiro Jr, M. Viola, M. Angrisani, M. Calussi, M. Cannistrà, M. Catarci, M. Cereda, M. Conte, M. Giordano, M. Pellicciaro, M. Vito Marino, M. E. Vaterlini, M. F. Jiménez, M. G. Lolli, M. I. Bellini, M. Lemma, M. M. Chiarello, M. Nicola, M. Arrigo, M. Caneda Mejia, M. Montes Manrique, M. Rodriguez-Lopez, M. Serradilla-Martín, M. Zambrano Lara, M. Martínez, M. Bagnall, M. Peter, M. Cañón Lara, M. Jimenez Gomez, M. Paniagua-García-Señorans, M. Perez Gonzalez, M. Rutegård, M. Saló, M. Franceschilli, M. Silveri, M. Veroux, M. Pezzulo, M. Nardi, M. Rottoli, M. Tolonen, M. Pedraza Ciro, M. Zuluagua, M. Cannavò, M. Cervellera, M. Iacobone, M. Montuori, M. Podda, M. García Domínguez, M. Bingol-Kologlu, M. Tahir, M. Lim, M. S. J. Wilson, M. Wilson, M. Campanelli, M. Bisaccia, M. De Rosa, M. Maruccia, M. Paterno, M. Pisano, M. Torre, M. Treviño, M. Zuolo, M. A. Hernandez Bartolome, M. Farina, M. Pera, M. Prieto Calvo, M. Sotelo, M. Myat Thway, M. Hassan, M. Salah Eldin Hassan, M. Azfar, M. Bouhuwaish, M. Taha, M. Zaiem, M. Korkoman, M. Guraieb, M. Shalaby, M. A. Raza, M. U. Younis, M. Elhadi, M. Zulfiqar Ali, N. Quazi, N. N. Dudi-Venkata, N. Alselaim, N. Loria, N. Villan Ramírez, N. Win Than, N. Smart, N. Trelles, N. Pinto, N. Allievi, N. Petrucciani, N. Antonacci, N. Cillara, N. de'Angelis, N. Gica, D.C. Nicolaescu, N. Krystek, N. Falco, N. Pecorelli, N. Tamini, N. A. Dallas, N. Machairas, N. Brito, N. Ahmed Fieturi, N. Ortega, O. Avila Mercado, O. Irkorucu, O. Alsharif, O. Valles, O. Ioannidis, O. Hernández Palmas, O. I. Hernandez Palmas, O. Sanz Guadarrama, O. Bozbiyik, P. Omelanczuk, P. Ottolino, P. Rodrigues, P. Ruiz, P. Campenni, P. Chiarade, P. Prieto Olivares, P. Baroffio, P. Panaccio, P. Wintringer, P. Di Fronzo, P. Talento, P. Favoriti, P. Sendino, P. Marsanic, P. Mifsut, P. Andrade, P. Ajawin, P. Abadia-Barnó, P. A. Najar Castañeda, P. O. Sillas Arevalos, P. Palazón Bellver, P. Soon Koh, P. Souza, P. Major, R. Singh Bali, R. Mohan Khattar, R. Lui, R. Bessa Melo, R. Ebrahiminia, R. Azar, R. López Murga, R. Caruso, R. Pirolo, R. Brady, R. J. Davies, R. Dholakia, R. Rattan, R. Singhal, R. Lim, R. Angelico, R. M. Isernia, R. Tutino, R. Faccincani, R. Peltrini, R. Carrera-Ceron, R. Tejos, R. Kashyap, R. Fajardo, R. Lozito, R. Madariaga Pareja, S. Garbarino, S. Di Saverio, S. Morales-Conde, S. Benli, S. Mansour, S. Flores, S. Limon Suarez, B. Santiago Lopez, S. Fuentes, S. Gortazar de las Casas, S. Napetti, S. Ortiz de Guzmán, S. Awad, S. A. Weckmann Luján, S. Gentilli, S. Grimaldi, S. Olivares Pizarro, S. Tayar, S. Nabi, S. M. Chan, S. Junaid, S. Rojas, S. Monetti, S. García, S. Salvans, S. Tenconi, S. Shaw, S. Santoni, S. A. Parra, S. Cárdenas,

S. Pérez-Bertólez, S. Chiappetta, S. Dessureault, S. Delis, S. Amore Bonapasta, S. Rausei, S. Scaringi, S. Keswani, S. M. Ali, S. Cetinkunar, T. L. D. Fung, T. Rawashdeh, T. N. López, T. De Campos, T. Calderon Duque, T. Perra, T. Liakakos, T. Daskalakis, T. Liakakos, T. Barnes, T. Koëter, T. Zalla, T. E. González, T. Elosua, T. Campagnaro, T. Brown, T. Luoto, T. Alpha Oumar, U. Giustizieri, U. Grossi, U. Bracale, U. Rivas, V. Sosa, V. Testa, V. Andriola, V. Tonini, V. Balassone, V. Celentano, V. Progno, V. Raju, V. Carroni, V. Cavallaro, V. Rao Katta, V. De Simone, V. Primo Romaguera, V. H. García Orozco, V. Luraschi, V. Rachkov, V. Turrado-Rodriguez, V. Visag-Castillo, V. Dowling, V. Graham, V. Papagni, V. Vigorita, V. Cordeiro Fonseca, V. Jimenez Careros, V. Bellato, W. Gonçalves, W. F. Powers, W. Grigg, W. O. Bechstein, Y. B. Lim, Y. Altinel, Z. Golubović, Z. Balciscueta.

Disclosure. The authors declare no conflicts of interest .

Conflicts of interest: The authors declare no conflicts of interest.

Supplementary material

Supplementary material is available at *BJS* online.

References

1. Ielpo B, Podda M, Pellino G, Pata F, Caruso R, Gravante G et al.; ACIE Appy Study Collaborative. Global attitudes in the management of acute appendicitis during COVID-19 pandemic: ACIE Appy Study. *Br J Surg* 2021; **108**:717–726. DOI: 10.1002/bjs.11999.
2. Javanmard-Emamghissi H, Boyd-Carson H, Hollyman M, Doleman B, Adiamah A, Lund JN et al.; COVID: HAREM (Had Appendicitis, Resolved/Recurred Emergency Morbidity/Mortality) Collaborators Group. The management of adult appendicitis during the COVID-19 pandemic: an interim analysis of a UK cohort study. *Tech Coloproctol* 2020; **25**:401–411.
3. Podda M, Pata F, Pellino G, Ielpo B, Di Saverio S. Acute appendicitis during the COVID-19 lockdown: never waste a crisis! *Br J Surg* 2021; **108**:e31–e32.
4. Selvaggi L, Menegon Tasselli F, Sciaudone G, Kontovounisios C, Cosenza A, Sica GS et al. Shifting paradigms in two common abdominal surgical emergencies during the pandemic. *Br J Surg* 2021; **108**:e127–e128.
5. Bellato V, Konishi T, Pellino G, An Y, Piciocchi A, Sensi B et al.; S-COVID Collaborative Group. Impact of asymptomatic COVID-19 patients in global surgical practice during the COVID-19 pandemic. *Br J Surg* 2020; DOI: 10.1002/bjs.11800.