

# THE LANCET

## Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

**This online publication has been corrected. The corrected version first appeared at [thelancet.com](http://thelancet.com) on March 4, 2021.**

Supplement to: GlobalSurg Collaborative and National Institute for Health Research Global Health Research Unit on Global Surgery. Global variation in postoperative mortality and complications after cancer surgery: a multicentre, prospective cohort study in 82 countries. *Lancet* 2021; published online Jan 21. [http://dx.doi.org/10.1016/S0140-6736\(21\)00001-5](http://dx.doi.org/10.1016/S0140-6736(21)00001-5).

## **Online supplementary appendix**

### **Global variation in postoperative mortality and complications following cancer surgery: A multicentre, prospective cohort study in 82 countries**

GlobalSurg Collaborative and NIHR Global Health Research Unit on Global Surgery\*

\* Investigators listed in online supplementary appendix.

## Table of Contents

<b>Supplementary tables and figures</b> .....	<b>2</b>
Table S1. Patient and operative characteristics by country income group stratified by cancer type, including missing data. ....	2
Figure S1. Missing values map. Missing values for main explanatory and dependent variables by observation. ....	3
Figure S2. Stage of presentation, 30-day mortality, and 30-day complications by cancer and country income group. ....	4
Figure S3. Proportion of all patients who sustained specific complications, stratified by cancer-type and country income group. .	5
Figure S4. A, adjusted proportion of patients dying or sustaining a major complication or any complication by day 30 after surgery stratified by country income group.....	6
Figure S5. A, method of determination of 30-day follow-up variables. B, basis for cancer diagnosis. ....	7
Table S2. Stage of presentation by region. ....	8
Table S3A. Cancer stage by other predictors (breast). ....	9
Table S3B. Cancer stage by other predictors (colon). ....	11
Table S3C. Cancer stage by other predictors (gastric). ....	13
Figure S6A. Comparison between preoperative clinical and postoperative final pathological staging.....	15
Figure S6B. Capacity to rescue from major complication: sensitivity analysis using postoperative final pathological staging. ....	16
Table S4A. Surgical procedure (breast). ....	17
Table S4B. Surgical procedure (colorectal). ....	18
Table S4C. Surgical procedure (gastric). ....	19
Table S5. Detailed outcomes stratified by cancer and country income level. ....	20
Table S6A. Breast cancer logistic regression analyses: 30-day mortality. ....	22
Table S6B. Breast cancer logistic regression analyses: major complication.....	23
Table S6C. Breast cancer logistic regression analyses: all complications. ....	25
Table S7A. Colorectal cancer logistic regression analyses: mortality.....	27
Table S7B. Colorectal cancer logistic regression analyses: major complication. ....	29
Table S7C. Colorectal cancer logistic regression analyses: all complications. ....	31
Table S8A. Gastric cancer logistic regression analyses: mortality.....	33
Table S8B. Gastric cancer logistic regression analyses: major complication. ....	35
Table S8C. Gastric cancer logistic regression analyses: all complications. ....	37
Table S9. Complications in patients who died. ....	39
Figure S7. Hospital type and facilities for centres treating colorectal and gastric cancer, stratified by country income group. ....	41
Table S10. Summary of hospital care services for centres treating gastric and colon cancer stratified by country income group. ....	42
Table S11. 30-day mortality in patients who sustained a major complication. ....	43
Table S12. 3-way mediation decomposition of proportion of effect of country income group on 30-day mortality.....	44
Table S13. Absolute risk difference for 30-day mortality after major complication in the presence of consistently available postoperative care infrastructure. ....	45
<b>Independent validation study</b> .....	<b>47</b>
Case ascertainment.....	47
Figure S8. Distribution of patients enrolled per hospital in validation sample. ....	47
Figure S9. Case ascertainment. ....	48
Data accuracy.....	49
Table S14. Availability of sampled variables to validators by country income group.....	49
Table S15. Validation study for continuous variable.....	50
Figure S10. Correlation of patient age in validation vs primary datasets (n=4520).....	50
Table S16. Validation study for categorical variables.....	51
<b>Authorship</b> .....	<b>52</b>
Writing group.....	52
Contributions.....	53
Conflicts of interest.....	54
National Leads.....	54
Local Collaborators.....	55
Data Validators.....	68
Protocol Authors.....	72
Protocol Translators.....	72

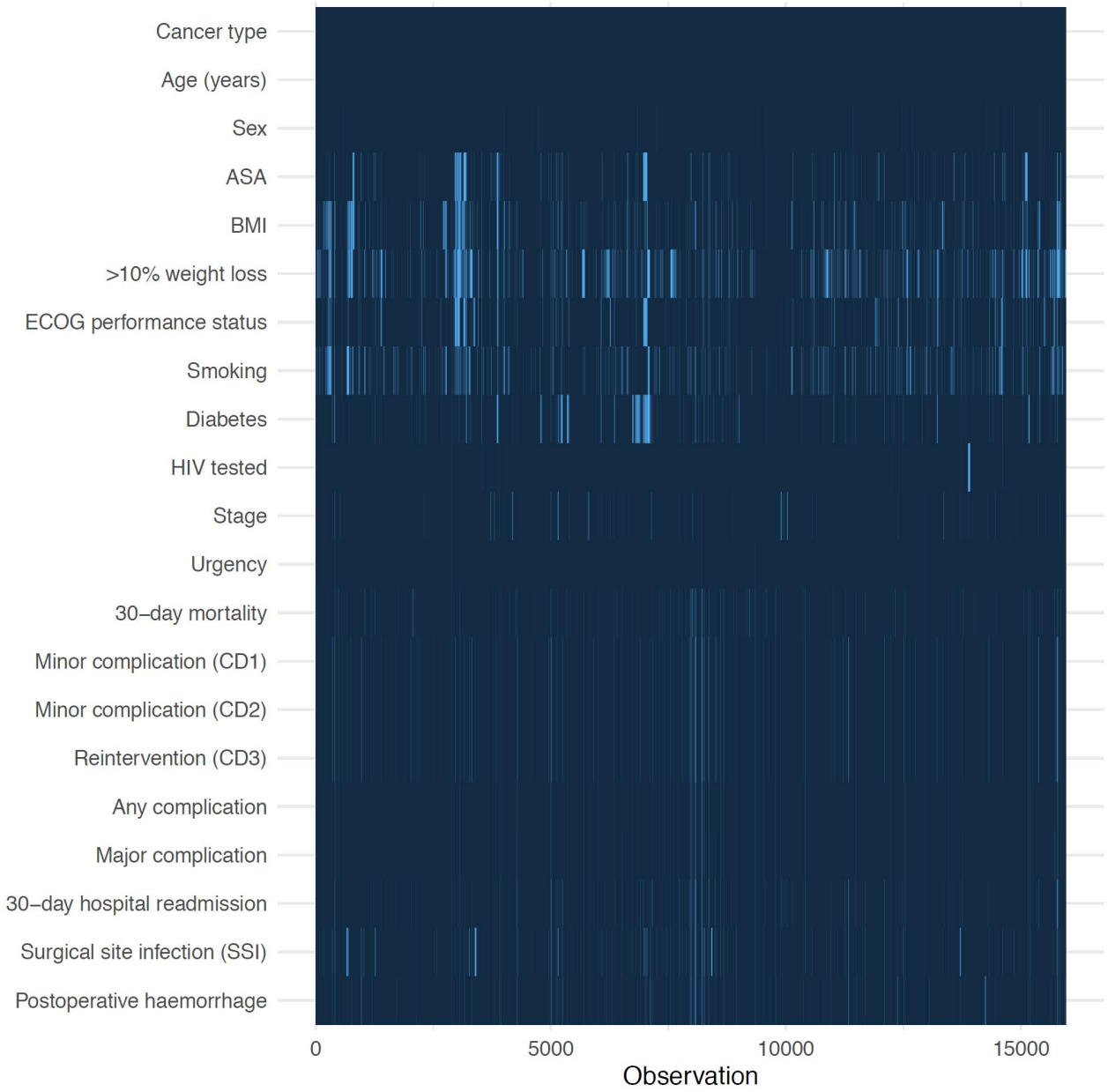
## Supplementary tables and figures

**Table S1. Patient and operative characteristics by country income group stratified by cancer type, including missing data.**

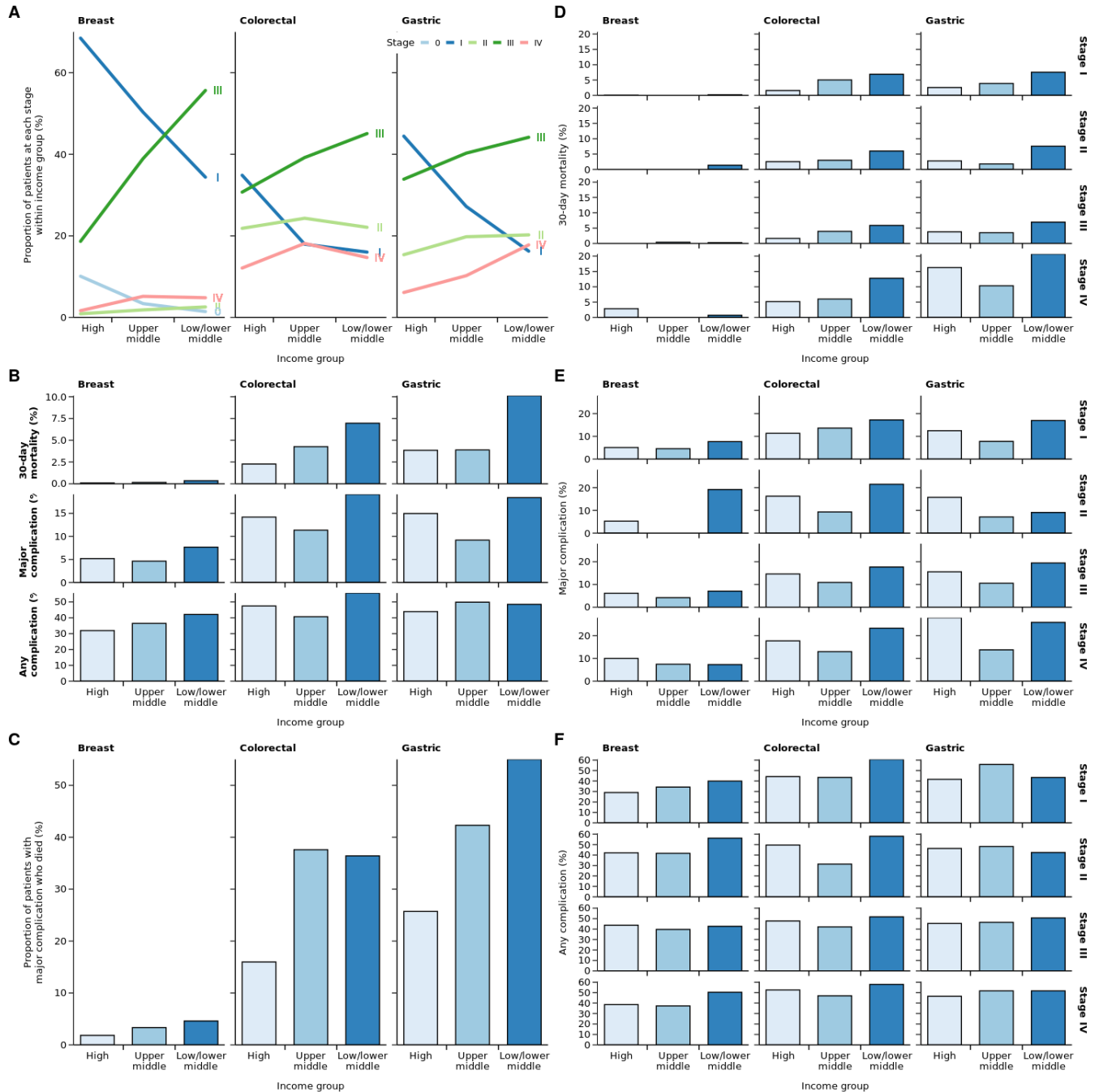
		Breast High	Breast Upper middle	Breast Low/lower middle	Colorectal High	Colorectal Upper middle	Colorectal Low/lower middle	Gastric High	Gastric Upper middle	Gastric Low/lower middle
Total N		4220	1319	2867	4174	1113	928	712	289	336
Age (years)	Mean (SD)	61.0 (13.4)	53.4 (13.1)	50.7 (11.9)	68.6 (12.4)	62.4 (12.3)	54.5 (14.4)	67.4 (12.8)	62.5 (13.2)	55.4 (12.9)
Sex	Male	43 (1.0)	13 (1.0)	32 (1.1)	2394 (57.4)	596 (53.5)	485 (52.3)	427 (60.0)	182 (63.0)	206 (61.3)
	Female	4172 (98.9)	1306 (99.0)	2833 (98.8)	1774 (42.5)	515 (46.3)	443 (47.7)	285 (40.0)	107 (37.0)	130 (38.7)
	(Missing)	5 (0.1)	0 (0.0)	2 (0.1)	6 (0.1)	2 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
ASA	I	767 (18.2)	462 (35.0)	937 (32.7)	319 (7.6)	219 (19.7)	238 (25.6)	62 (8.7)	58 (20.1)	110 (32.7)
	II	2383 (56.5)	726 (55.0)	1576 (55.0)	2042 (48.9)	612 (55.0)	506 (54.5)	344 (48.3)	136 (47.1)	160 (47.6)
	III	744 (17.6)	83 (6.3)	223 (7.8)	1545 (37.0)	227 (20.4)	141 (15.2)	269 (37.8)	81 (28.0)	48 (14.3)
	IV	28 (0.7)	11 (0.8)	10 (0.3)	166 (4.0)	23 (2.1)	18 (1.9)	23 (3.2)	8 (2.8)	8 (2.4)
	V	2 (0.0)	0 (0.0)	0 (0.0)	15 (0.4)	1 (0.1)	6 (0.6)	0 (0.0)	0 (0.0)	4 (1.2)
	(Missing)	296 (7.0)	37 (2.8)	121 (4.2)	87 (2.1)	31 (2.8)	19 (2.0)	14 (2.0)	6 (2.1)	6 (1.8)
	Normal									
BMI	weight (BMI 18.5 to 24.9)	1443 (34.2)	462 (35.0)	887 (30.9)	1510 (36.2)	521 (46.8)	456 (49.1)	314 (44.1)	165 (57.1)	168 (50.0)
	Underweight (BMI < 18.5)	74 (1.8)	23 (1.7)	62 (2.2)	119 (2.9)	63 (5.7)	111 (12.0)	38 (5.3)	25 (8.7)	61 (18.2)
	Overweight (BMI 25 to 30)	1341 (31.8)	458 (34.7)	1077 (37.6)	1517 (36.3)	348 (31.3)	206 (22.2)	221 (31.0)	76 (26.3)	71 (21.1)
	Obese (BMI >30)	928 (22.0)	308 (23.4)	736 (25.7)	749 (17.9)	145 (13.0)	115 (12.4)	96 (13.5)	17 (5.9)	16 (4.8)
	(Missing)	434 (10.3)	68 (5.2)	105 (3.7)	279 (6.7)	36 (3.2)	40 (4.3)	43 (6.0)	6 (2.1)	20 (6.0)
>10% weight loss	No	3321 (78.7)	1091 (82.7)	2468 (86.1)	2817 (67.5)	606 (54.4)	337 (36.3)	422 (59.3)	116 (40.1)	91 (27.1)
	Yes	98 (2.3)	84 (6.4)	187 (6.5)	732 (17.5)	427 (38.4)	514 (55.4)	219 (30.8)	162 (56.1)	216 (64.3)
	(Missing)	801 (19.0)	144 (10.9)	212 (7.4)	625 (15.0)	80 (7.2)	77 (8.3)	71 (10.0)	11 (3.8)	29 (8.6)
ECOG performance status	0	2688 (63.7)	984 (74.6)	1657 (57.8)	2056 (49.3)	583 (52.4)	379 (40.8)	346 (48.6)	165 (57.1)	100 (29.8)
	1	838 (19.9)	242 (18.3)	621 (21.7)	1116 (26.7)	319 (28.7)	318 (34.3)	198 (27.8)	78 (27.0)	146 (43.5)
	2	311 (7.4)	48 (3.6)	400 (14.0)	557 (13.3)	125 (11.2)	117 (12.6)	93 (13.1)	28 (9.7)	53 (15.8)
	3	73 (1.7)	17 (1.3)	68 (2.4)	188 (4.5)	63 (5.7)	81 (8.7)	38 (5.3)	14 (4.8)	27 (8.0)
	4	6 (0.1)	1 (0.1)	14 (0.5)	22 (0.5)	6 (0.5)	12 (1.3)	4 (0.6)	2 (0.7)	5 (1.5)
	(Missing)	304 (7.2)	27 (2.0)	107 (3.7)	235 (5.6)	17 (1.5)	21 (2.3)	33 (4.6)	2 (0.7)	5 (1.5)
	Smoking	No, never	2800 (66.4)	1056 (80.1)	2728 (95.2)	2236 (53.6)	688 (61.8)	684 (73.7)	327 (45.9)	158 (54.7)
Stopped >6 weeks ago	517 (12.3)	86 (6.5)	34 (1.2)	965 (23.1)	170 (15.3)	103 (11.1)	168 (23.6)	66 (22.8)	44 (13.1)	
Yes, current smoker	562 (13.3)	133 (10.1)	27 (0.9)	496 (11.9)	173 (15.5)	100 (10.8)	116 (16.3)	41 (14.2)	43 (12.8)	
(Missing)	341 (8.1)	44 (3.3)	78 (2.7)	477 (11.4)	82 (7.4)	41 (4.4)	101 (14.2)	24 (8.3)	30 (8.9)	
Diabetes	No	3696 (87.6)	1074 (81.4)	2107 (73.5)	3311 (79.3)	859 (77.2)	720 (77.6)	587 (82.4)	246 (85.1)	273 (81.2)
	Diet	71 (1.7)	16 (1.2)	27 (0.9)	125 (3.0)	20 (1.8)	14 (1.5)	13 (1.8)	6 (2.1)	4 (1.2)
	Medication (non-insulin)	307 (7.3)	139 (10.5)	312 (10.9)	510 (12.2)	161 (14.5)	84 (9.1)	78 (11.0)	24 (8.3)	26 (7.7)
Insulin	92 (2.2)	55 (4.2)	136 (4.7)	160 (3.8)	52 (4.7)	43 (4.6)	27 (3.8)	13 (4.5)	12 (3.6)	
(Missing)	54 (1.3)	35 (2.7)	285 (9.9)	68 (1.6)	21 (1.9)	67 (7.2)	7 (1.0)	0 (0.0)	21 (6.2)	
HIV tested	No	3995 (94.7)	779 (59.1)	1349 (47.1)	3984 (95.4)	689 (61.9)	616 (66.4)	671 (94.2)	158 (54.7)	153 (45.5)
	Yes - Negative	179 (4.2)	524 (39.7)	1511 (52.7)	186 (4.5)	413 (37.1)	308 (33.2)	39 (5.5)	130 (45.0)	182 (54.2)
	Yes - Positive	6 (0.1)	16 (1.2)	7 (0.2)	2 (0.0)	9 (0.8)	4 (0.4)	1 (0.1)	1 (0.3)	1 (0.3)
	(Missing)	40 (0.9)	0 (0.0)	0 (0.0)	2 (0.0)	2 (0.2)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)
Distance to home (km)	< 10 km	1637 (38.8)	340 (25.8)	352 (12.3)	1630 (39.1)	270 (24.3)	179 (19.3)	230 (32.3)	67 (23.2)	44 (13.1)
	10-20 km	859 (20.4)	272 (20.6)	460 (16.0)	814 (19.5)	266 (23.9)	170 (18.3)	125 (17.6)	79 (27.3)	43 (12.8)
	20-50 km	809 (19.2)	241 (18.3)	511 (17.8)	791 (19.0)	206 (18.5)	200 (21.6)	156 (21.9)	32 (11.1)	57 (17.0)
	50-100 km	346 (8.2)	78 (5.9)	385 (13.4)	324 (7.8)	89 (8.0)	97 (10.5)	68 (9.6)	28 (9.7)	32 (9.5)
	>100 km	219 (5.2)	199 (15.1)	1039 (36.2)	279 (6.7)	176 (15.8)	235 (25.3)	78 (11.0)	64 (22.1)	135 (40.2)
	(Missing)	350 (8.3)	189 (14.3)	120 (4.2)	336 (8.0)	106 (9.5)	47 (5.1)	55 (7.7)	19 (6.6)	25 (7.4)

Numbers are n (%), unless otherwise indicated. ASA, American Society of Anesthesiologists operative risk grade. ECOG, Eastern Cooperative Oncology Group. High income included 31 countries and 241 hospitals. Upper middle income included 23 countries and 81 hospitals. Lower middle/low income included 28 countries and 106 hospitals. The total column therefore includes 82 countries and 428 hospitals.

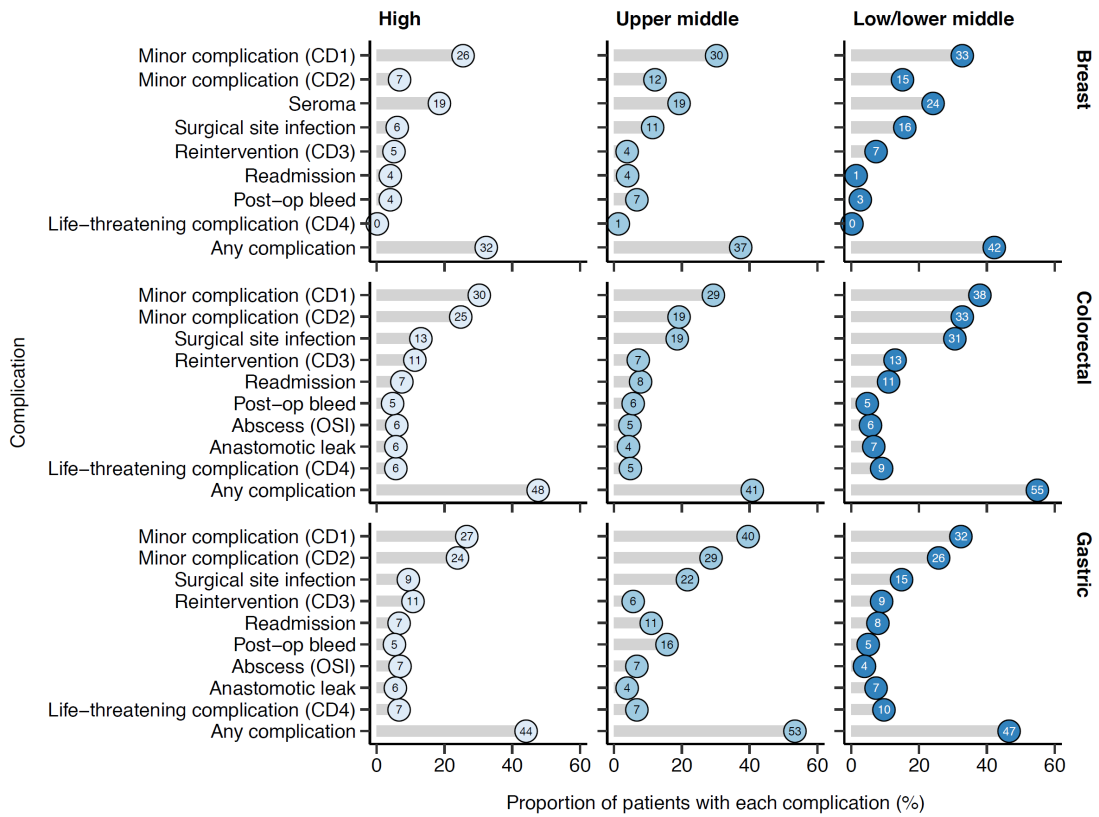
**Figure S1. Missing values map. Missing values for main explanatory and dependent variables by observation.**



**Figure S2. Stage of presentation, 30-day mortality, and 30-day complications by cancer and country income group. Panels A, B and C are replicated from Figure 3 to aid comparisons. A, proportion of patients enrolled by cancer stage by country income group. B, proportion of patients dying or sustaining a major complication or any complication by day 30 after surgery stratified by country income group. C, proportion of patients sustaining a major complication who died within 30 days. D, E, F, 30-day mortality (D), major complication (E), and any complication (F) stratified by cancer type, cancer stage, and country income group.**

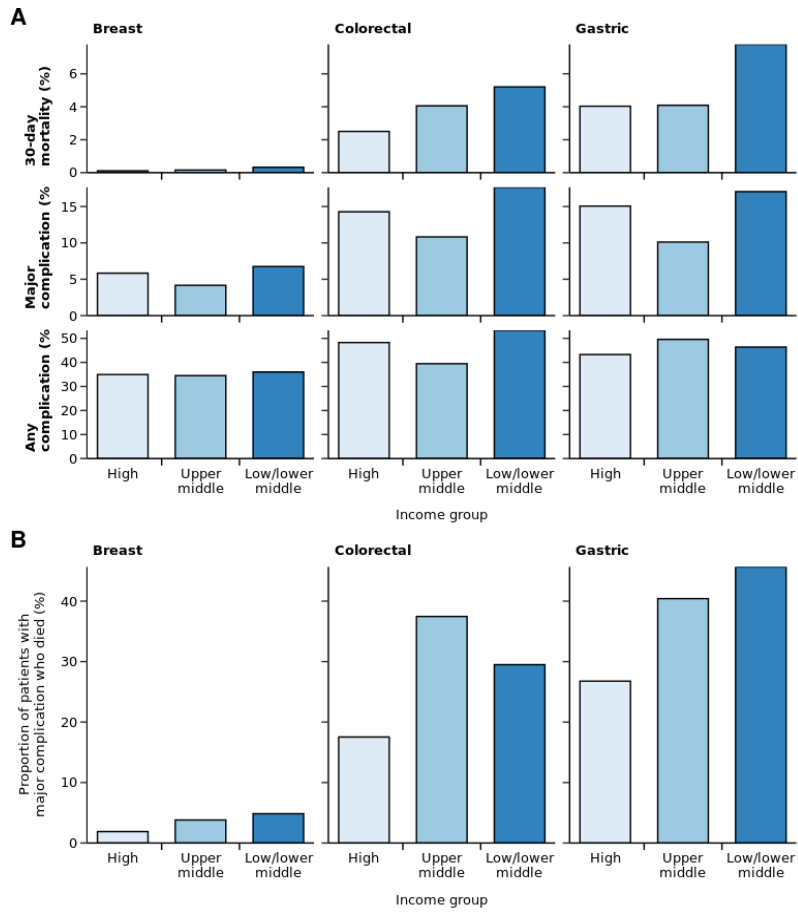


**Figure S3. Proportion of all patients who sustained specific complications, stratified by cancer-type and country income group.**



Ordered by overall frequency. CD, Clavien-Dindo complication grade; OSI, organ space infection. See appendix pp 21-22 for detailed table.

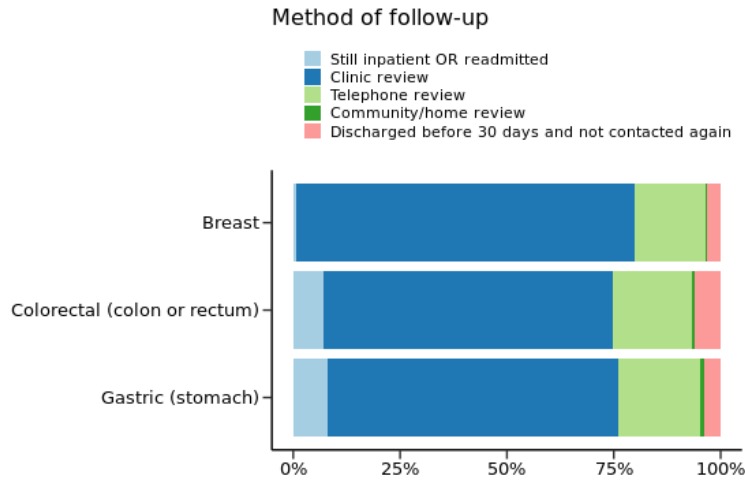
**Figure S4. A, adjusted proportion of patients dying or sustaining a major complication or any complication by day 30 after surgery stratified by country income group. B, proportion of patients sustaining a major complication who died within 30 days. Proportions are adjusted for patient complications using multivariable (reduced) logistic regression models in Table S6A/B/C (breast), Table S7A/B/C (colorectal), Table S8A/B/C (gastric), pp 23-39.**



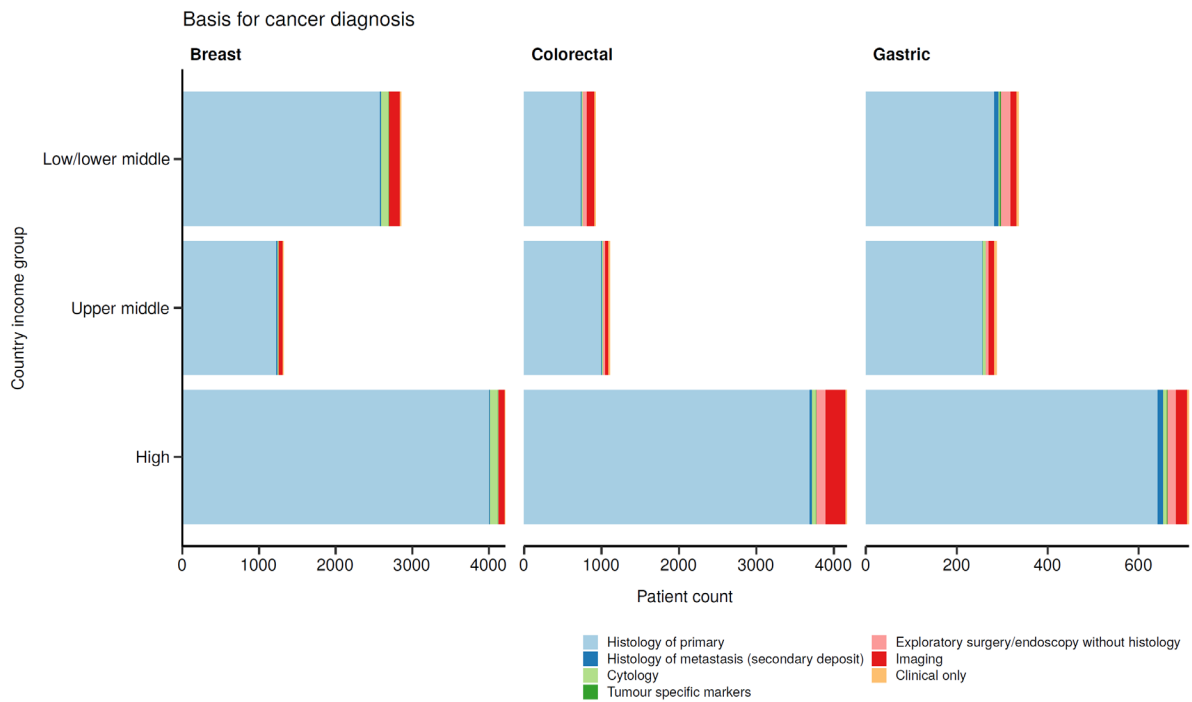


**Figure S5. A, method of determination of 30-day follow-up variables. B, basis for cancer diagnosis stratified by cancer type and country income group.**

A



B



**Table S2. Stage of presentation by region.**

World Bank income (tertile)		High	Upper middle	Low/lower middle	p
eTNM pre-op (breast)	Tis	427 (10.1)	45 (3.4)	42 (1.5)	<0.001
	L1	1760 (41.8)	298 (22.7)	245 (8.7)	
	L2	1129 (26.8)	361 (27.5)	741 (26.2)	
	A	38 (0.9)	25 (1.9)	74 (2.6)	
	R1	646 (15.3)	404 (30.8)	1184 (41.8)	
	R2	141 (3.3)	109 (8.3)	406 (14.3)	
	M+	70 (1.7)	71 (5.4)	140 (4.9)	
eTNM pre-op (colorectal)	L	1457 (35.1)	198 (17.9)	147 (16.2)	<0.001
	A	911 (21.9)	269 (24.3)	206 (22.7)	
	R+	1276 (30.7)	437 (39.4)	415 (45.8)	
	M+	511 (12.3)	204 (18.4)	138 (15.2)	
eTNM pre-op (gastric)	L	316 (44.5)	77 (27.3)	57 (17.2)	<0.001
	A	108 (15.2)	58 (20.6)	69 (20.8)	
	R+	243 (34.2)	115 (40.8)	147 (44.4)	
	M+	43 (6.1)	32 (11.3)	58 (17.5)	

eTNM, Essential TNM Classification of Malignant Tumours as defined by the Union for International Cancer Control (UICC).

*Breast cancer:* Tis, No invasive cancer (e.g. DCIS); L1, Tumour ≤2 cm in size (T1); L2, Tumour >2 cm in size (T2/T3); A, Inflammatory cancer, chest wall invasion or ulceration present (T4); R1, 1 to 3 nodes involved inside axilla but none outside axilla (N1); R2, >3 nodes involved inside axilla or nodal involvement outside axilla (N2/N3); M+, Metastases present (M1).

*Gastric cancer:* L, Tumour contained within stomach wall with no nodal involvement (Stage I); A, Tumour through stomach wall with no nodal involvement (Stage II); R+, Regional lymph node involvement (Stage III); M+, Metastases present (Stage IV)

*Colorectal cancer:* L, Tumour contained within bowel wall with no nodal involvement (Stage I); A, Tumour through bowel wall with no nodal involvement (Stage II); R+, Regional lymph node involvement (Stage III); M+, Metastases present (Stage IV).

**Table S3A. Cancer stage by other predictors (breast).**

		<b>Tis</b> N=514	<b>L1/L2</b> N=4534	<b>A</b> N=137	<b>R1/R2</b> N=2890	<b>M+</b> N=281	<b>p</b>
Age (years)	Mean (SD)	56.9 (12.9)	58.4 (13.8)	57.3 (16.9)	53.0 (13.1)	53.9 (13.3)	<0.001
Sex	Male	3 (0.6)	40 (0.9)	5 (3.6)	37 (1.3)	3 (1.1)	0.013
	Female	510 (99.4)	4491 (99.1)	132 (96.4)	2850 (98.7)	278 (98.9)	
ASA	I	122 (26.2)	1108 (25.9)	31 (23.7)	816 (29.6)	69 (25.7)	<0.001
	II	273 (58.7)	2553 (59.6)	69 (52.7)	1625 (59.0)	142 (52.8)	
	III	66 (14.2)	599 (14.0)	30 (22.9)	303 (11.0)	48 (17.8)	
	IV	2 (0.4)	23 (0.5)	1 (0.8)	12 (0.4)	10 (3.7)	
	V	2 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
BMI	Normal weight (BMI 18.5 to 24.9)	172 (37.2)	1537 (36.9)	45 (34.4)	933 (34.2)	92 (34.3)	0.122
	Underweight (BMI < 18.5)	5 (1.1)	90 (2.2)	2 (1.5)	54 (2.0)	7 (2.6)	
	Overweight (BMI 25 to 30)	153 (33.1)	1529 (36.7)	45 (34.4)	1040 (38.1)	90 (33.6)	
	Obese (BMI >30)	132 (28.6)	1010 (24.2)	39 (29.8)	705 (25.8)	79 (29.5)	
>10% weight loss	No	397 (98.5)	3730 (96.5)	109 (90.8)	2388 (93.0)	216 (87.1)	<0.001
	Yes	6 (1.5)	136 (3.5)	11 (9.2)	179 (7.0)	32 (12.9)	
ECOG performance status	0	359 (76.9)	2903 (67.8)	72 (55.4)	1823 (65.8)	142 (52.0)	<0.001
	1	78 (16.7)	928 (21.7)	35 (26.9)	573 (20.7)	76 (27.8)	
	2	25 (5.4)	361 (8.4)	19 (14.6)	319 (11.5)	34 (12.5)	
	3	3 (0.6)	78 (1.8)	4 (3.1)	52 (1.9)	19 (7.0)	
	4	2 (0.4)	12 (0.3)	0 (0.0)	5 (0.2)	2 (0.7)	
Smoking	No, never	354 (76.5)	3373 (78.9)	115 (90.6)	2459 (88.8)	239 (90.9)	<0.001
	Stopped >6 weeks ago	53 (11.4)	420 (9.8)	9 (7.1)	143 (5.2)	9 (3.4)	
	Yes, current smoker	56 (12.1)	481 (11.3)	3 (2.4)	167 (6.0)	15 (5.7)	
Diabetes	No	444 (88.3)	3783 (86.5)	98 (81.0)	2286 (84.1)	228 (84.1)	0.004
	Diet	10 (2.0)	64 (1.5)	4 (3.3)	30 (1.1)	6 (2.2)	
	Medication (non-insulin)	39 (7.8)	392 (9.0)	12 (9.9)	285 (10.5)	24 (8.9)	
	Insulin	10 (2.0)	134 (3.1)	7 (5.8)	117 (4.3)	13 (4.8)	
HIV tested	No	456 (89.4)	3572 (79.3)	92 (67.2)	1809 (62.7)	170 (60.7)	<0.001
	Yes - Negative	52 (10.2)	927 (20.6)	45 (32.8)	1054 (36.6)	110 (39.3)	
	Yes - Positive	2 (0.4)	7 (0.2)	0 (0.0)	20 (0.7)	0 (0.0)	
Distance to home (km)	< 10 km	172 (36.8)	1415 (34.1)	33 (25.8)	617 (22.9)	76 (29.5)	<0.001
	10-20 km	120 (25.6)	909 (21.9)	16 (12.5)	489 (18.1)	52 (20.2)	
	20-50 km	96 (20.5)	840 (20.2)	31 (24.2)	532 (19.7)	59 (22.9)	
	50-100 km	41 (8.8)	415 (10.0)	20 (15.6)	306 (11.4)	22 (8.5)	
	>100 km	39 (8.3)	574 (13.8)	28 (21.9)	751 (27.9)	49 (19.0)	
Mode of diagnosis	Symptomatic	174 (34.7)	2547 (56.9)	120 (89.6)	2302 (80.3)	220 (78.9)	<0.001
	Screening	299 (59.7)	1519 (33.9)	6 (4.5)	267 (9.3)	25 (9.0)	
	Detected incidentally	28 (5.6)	410 (9.2)	8 (6.0)	296 (10.3)	34 (12.2)	
Urgency	Elective	511 (99.4)	4515 (99.6)	133 (97.1)	2872 (99.4)	273 (97.5)	<0.001
	Emergency	3 (0.6)	19 (0.4)	4 (2.9)	18 (0.6)	7 (2.5)	
Treatment intent	Palliative	5 (1.0)	50 (1.1)	10 (7.3)	81 (2.8)	98 (35.0)	<0.001
	Curative	509 (99.0)	4483 (98.9)	127 (92.7)	2809 (97.2)	182 (65.0)	
Primary procedure	B27 Mastectomy	161 (31.3)	1559 (34.4)	100 (73.0)	1747 (60.5)	193 (69.7)	<0.001
	B28 Partial mastectomy / wide local excision / lumpectomy	305 (59.3)	2790 (61.5)	34 (24.8)	1037 (35.9)	61 (22.0)	
	B32 Open biopsy of breast	21 (4.1)	54 (1.2)	1 (0.7)	15 (0.5)	5 (1.8)	
	B37 Other operations on breast	27 (5.3)	131 (2.9)	2 (1.5)	89 (3.1)	18 (6.5)	
SNLB	No, not available in this hospital	9 (1.8)	236 (5.3)	12 (9.0)	309 (11.2)	42 (15.9)	<0.001
	No, but available in this hospital	259 (52.1)	894 (20.1)	89 (66.4)	1784 (64.8)	165 (62.5)	
	Yes, single technique	131 (26.4)	1825 (41.1)	15 (11.2)	431 (15.7)	45 (17.0)	
	Yes, dual technique	98 (19.7)	1487 (33.5)	18 (13.4)	227 (8.3)	12 (4.5)	
Axillary lymph node dissection	No	467 (91.7)	3263 (73.2)	50 (37.0)	560 (19.9)	57 (21.1)	<0.001
	Yes	42 (8.3)	1197 (26.8)	85 (63.0)	2254 (80.1)	213 (78.9)	
Margin check	No, not available in this hospital	23 (4.9)	344 (7.9)	14 (10.4)	307 (11.1)	40 (15.3)	<0.001
	No, but available in this hospital	193 (41.2)	1927 (44.5)	95 (70.4)	1681 (60.8)	139 (53.3)	
	Yes, by x-ray	198 (42.2)	1028 (23.7)	6 (4.4)	236 (8.5)	17 (6.5)	
	Yes, by frozen section	55 (11.7)	1034 (23.9)	20 (14.8)	540 (19.5)	65 (24.9)	
Primary reconstruction	No, not available in this hospital	28 (5.4)	306 (6.8)	13 (9.5)	307 (10.6)	34 (12.1)	<0.001
	No, but available in this hospital	358 (69.6)	3434 (75.8)	96 (70.1)	2116 (73.3)	199 (71.1)	
	Yes, immediate - prosthesis	52 (10.1)	227 (5.0)	2 (1.5)	117 (4.1)	4 (1.4)	
	Yes, immediate - flap	59 (11.5)	449 (9.9)	14 (10.2)	237 (8.2)	32 (11.4)	
	Yes, planned at later stage	17 (3.3)	117 (2.6)	12 (8.8)	109 (3.8)	11 (3.9)	

Essential TNM Classification of Malignant Tumours (eTNM), as defined by the Union for International Cancer Control (UICC), for breast cancer:

Tis, No invasive cancer (e.g. DCIS); L1, Tumour ≤2 cm in size (T1); L2, Tumour >2 cm in size (T2/T3); A, Inflammatory cancer, chest wall invasion or ulceration present (T4); R1, 1 to 3 nodes involved inside axilla but none outside axilla (N1); R2, >3 nodes

involved inside axilla or nodal involvement outside axilla (N2/N3); M+, Metastases present (M1). ASA, American Society of Anesthesiologists operative risk grade; BMI, body mass index; ECOG, Eastern Cooperative Oncology Group; HIV, human immunodeficiency virus; SNLB, sentinel lymph node biopsy; SD, standard deviation. Data are n (%).

**Table S3B. Cancer stage by other predictors (colon).**

		L N=1802	A N=1386	R+ N=2128	M+ N=853	p
Age (years)	Mean (SD)	66.9 (13.0)	67.1 (13.6)	63.8 (13.8)	63.3 (14.0)	<0.001
Sex	Male	1026 (57.1)	771 (55.6)	1172 (55.1)	480 (56.4)	0.636
	Female	771 (42.9)	615 (44.4)	955 (44.9)	371 (43.6)	
ASA	I	207 (11.7)	193 (14.3)	264 (12.7)	104 (12.5)	<0.001
	II	892 (50.4)	679 (50.2)	1175 (56.5)	391 (46.9)	
	III	608 (34.4)	426 (31.5)	578 (27.8)	292 (35.0)	
	IV	59 (3.3)	45 (3.3)	60 (2.9)	43 (5.2)	
	V	4 (0.2)	9 (0.7)	4 (0.2)	4 (0.5)	
BMI	Normal weight (BMI 18.5 to 24.9)	621 (36.5)	570 (43.9)	900 (44.3)	377 (47.7)	<0.001
	Underweight (BMI < 18.5)	57 (3.4)	69 (5.3)	107 (5.3)	60 (7.6)	
	Overweight (BMI 25 to 30)	666 (39.2)	449 (34.6)	693 (34.1)	253 (32.0)	
	Obese (BMI >30)	356 (20.9)	210 (16.2)	331 (16.3)	100 (12.7)	
>10% weight loss	No	1249 (81.0)	846 (70.4)	1248 (65.4)	399 (53.8)	<0.001
	Yes	293 (19.0)	355 (29.6)	660 (34.6)	342 (46.2)	
ECOG performance status	0	963 (56.3)	640 (48.5)	1024 (50.0)	379 (46.3)	<0.001
	1	454 (26.5)	397 (30.1)	658 (32.1)	231 (28.2)	
	2	208 (12.2)	178 (13.5)	259 (12.6)	146 (17.8)	
	3	76 (4.4)	90 (6.8)	102 (5.0)	56 (6.8)	
	4	10 (0.6)	15 (1.1)	7 (0.3)	7 (0.9)	
Smoking	No, never	994 (61.8)	818 (66.2)	1283 (65.3)	485 (63.3)	0.154
	Stopped >6 weeks ago	390 (24.3)	253 (20.5)	410 (20.9)	176 (23.0)	
	Yes, current smoker	224 (13.9)	164 (13.3)	271 (13.8)	105 (13.7)	
Diabetes	No	1405 (80.1)	1096 (81.3)	1681 (80.7)	677 (81.2)	0.331
	Diet	41 (2.3)	42 (3.1)	61 (2.9)	15 (1.8)	
	Medication (non-insulin)	220 (12.5)	159 (11.8)	264 (12.7)	107 (12.8)	
	Insulin	89 (5.1)	51 (3.8)	78 (3.7)	35 (4.2)	
HIV tested	No	1630 (90.5)	1151 (83.0)	1760 (82.7)	718 (84.3)	<0.001
	Yes - Negative	166 (9.2)	232 (16.7)	365 (17.2)	129 (15.1)	
	Yes - Positive	5 (0.3)	3 (0.2)	2 (0.1)	5 (0.6)	
Distance to home (km)	< 10 km	663 (40.2)	458 (36.1)	688 (34.7)	259 (33.0)	<0.001
	10-20 km	342 (20.7)	296 (23.3)	408 (20.6)	196 (24.9)	
	20-50 km	355 (21.5)	246 (19.4)	414 (20.9)	166 (21.1)	
	50-100 km	142 (8.6)	117 (9.2)	180 (9.1)	70 (8.9)	
	>100 km	147 (8.9)	152 (12.0)	290 (14.6)	95 (12.1)	
Mode of diagnosis	Symptomatic	1101 (62.2)	1140 (82.8)	1815 (85.9)	746 (88.7)	<0.001
	Screening	478 (27.0)	154 (11.2)	205 (9.7)	54 (6.4)	
	Detected incidentally	192 (10.8)	82 (6.0)	92 (4.4)	41 (4.9)	
Urgency	Elective	1661 (92.2)	1191 (85.9)	1888 (88.7)	593 (69.5)	<0.001
	Emergency	141 (7.8)	195 (14.1)	240 (11.3)	260 (30.5)	
Treatment intent	Palliative	46 (2.6)	85 (6.1)	129 (6.1)	442 (51.8)	<0.001
	Curative	1756 (97.4)	1301 (93.9)	1999 (93.9)	411 (48.2)	
WHO checklist	No, not available in this hospital	145 (8.3)	202 (15.0)	235 (11.4)	99 (11.9)	<0.001
	No, but available in this hospital	63 (3.6)	67 (5.0)	106 (5.1)	46 (5.5)	
	Yes	1541 (88.1)	1079 (80.0)	1725 (83.5)	689 (82.6)	
Primary procedure	T309 Abdomen: Laparotomy with no other procedure	7 (0.4)	5 (0.4)	5 (0.2)	12 (1.4)	<0.001
	T43 Abdomen: Diagnostic laparoscopy with no other procedure	2 (0.1)	0 (0.0)	1 (0.0)	2 (0.2)	
	G74 Small bowel: Formation of ileostomy only	5 (0.3)	6 (0.4)	11 (0.5)	24 (2.8)	
	H04 Colon: Total excision of colon and rectum	13 (0.7)	10 (0.7)	16 (0.8)	10 (1.2)	
	H05 Colon: Total excision of colon	34 (1.9)	33 (2.4)	37 (1.7)	11 (1.3)	
	H06 Colon: Extended excision of right hemicolon	80 (4.4)	89 (6.4)	117 (5.5)	36 (4.2)	
	H07 Colon: Excision of right hemicolon	588 (32.7)	324 (23.4)	503 (23.6)	166 (19.5)	
	H08 Colon: Excision of transverse colon	24 (1.3)	14 (1.0)	22 (1.0)	9 (1.1)	
	H09 Colon: Excision of left hemicolon	142 (7.9)	110 (7.9)	139 (6.5)	54 (6.3)	
	H10 Colon: Excision of sigmoid colon	248 (13.8)	177 (12.8)	192 (9.0)	96 (11.3)	

	H11 Colon: Other excision of colon	35 (1.9)	38 (2.7)	26 (1.2)	22 (2.6)	
	H15 Colon: Formation of any colonic stoma	22 (1.2)	26 (1.9)	53 (2.5)	116 (13.6)	
	H19 Colon: Other open operations on colon	15 (0.8)	20 (1.4)	20 (0.9)	33 (3.9)	
	H331 Rectum: Abdominoperineal resection	83 (4.6)	116 (8.4)	217 (10.2)	51 (6.0)	
	H332 Rectum: Resection with anastomosis of colon to anus	57 (3.2)	28 (2.0)	93 (4.4)	17 (2.0)	
	H333 Rectum: Anterior resection with anastomosis	334 (18.6)	292 (21.1)	516 (24.3)	119 (14.0)	
	H335 Rectum: Resection with closure of rectal stump (Hartmanns)	48 (2.7)	74 (5.3)	120 (5.6)	53 (6.2)	
	H46 Rectum: Other open operations on rectum	63 (3.5)	24 (1.7)	39 (1.8)	22 (2.6)	
Approach	Open	763 (42.6)	774 (56.1)	1195 (56.3)	597 (70.4)	<0.001
	Minimally invasive	1027 (57.4)	606 (43.9)	928 (43.7)	251 (29.6)	
Site	Caecum	233 (13.1)	116 (8.4)	196 (9.3)	96 (11.4)	<0.001
	Ascending colon	385 (21.7)	240 (17.5)	372 (17.6)	129 (15.3)	
	Transverse colon	136 (7.7)	105 (7.6)	127 (6.0)	72 (8.6)	
	Descending colon	125 (7.0)	125 (9.1)	116 (5.5)	61 (7.2)	
	Sigmoid colon	402 (22.6)	310 (22.6)	387 (18.3)	212 (25.2)	
	High rectum (>10 to 15 cm)	178 (10.0)	173 (12.6)	256 (12.1)	111 (13.2)	
	Middle rectum (>5 to 10 cm)	131 (7.4)	131 (9.5)	283 (13.4)	68 (8.1)	
	Low rectum (<=5 cm from anal verge)	186 (10.5)	173 (12.6)	379 (17.9)	93 (11.0)	
Anastomosis	Not performed	269 (15.3)	330 (24.3)	495 (23.9)	327 (39.4)	<0.001
	Handsewn	330 (18.8)	300 (22.1)	391 (18.9)	153 (18.5)	
	Stapled	1161 (66.0)	727 (53.6)	1188 (57.3)	349 (42.1)	
Pre-op obstruction	No	1575 (91.0)	1075 (79.5)	1678 (81.4)	496 (60.0)	<0.001
	Yes	155 (9.0)	277 (20.5)	383 (18.6)	330 (40.0)	
Pre-op perforation	No	1750 (98.3)	1258 (93.0)	1983 (94.3)	745 (89.1)	<0.001
	Yes	30 (1.7)	94 (7.0)	120 (5.7)	91 (10.9)	
Stoma formed	No	1338 (75.4)	839 (61.2)	1143 (54.2)	423 (49.9)	<0.001
	Yes, loop ileostomy	173 (9.8)	173 (12.6)	378 (17.9)	102 (12.0)	
	Yes, end ileostomy	47 (2.6)	55 (4.0)	80 (3.8)	31 (3.7)	
	Yes, loop colostomy	51 (2.9)	54 (3.9)	122 (5.8)	105 (12.4)	
	Yes, end colostomy	165 (9.3)	251 (18.3)	385 (18.3)	187 (22.1)	

Essential TNM Classification of Malignant Tumours (eTNM), as defined by the Union for International Cancer Control (UICC), for colorectal cancer:

L, Tumour contained within bowel wall with no nodal involvement (Stage I); A, Tumour through bowel wall with no nodal involvement (Stage II); R+, Regional lymph node involvement (Stage III); M+, Metastases present (Stage IV). ASA, American Society of Anesthesiologists operative risk grade; BMI, body mass index; ECOG, Eastern Cooperative Oncology Group; HIV, human immunodeficiency virus; SD, standard deviation. Data are n (%).

**Table S3C. Cancer stage by other predictors (gastric).**

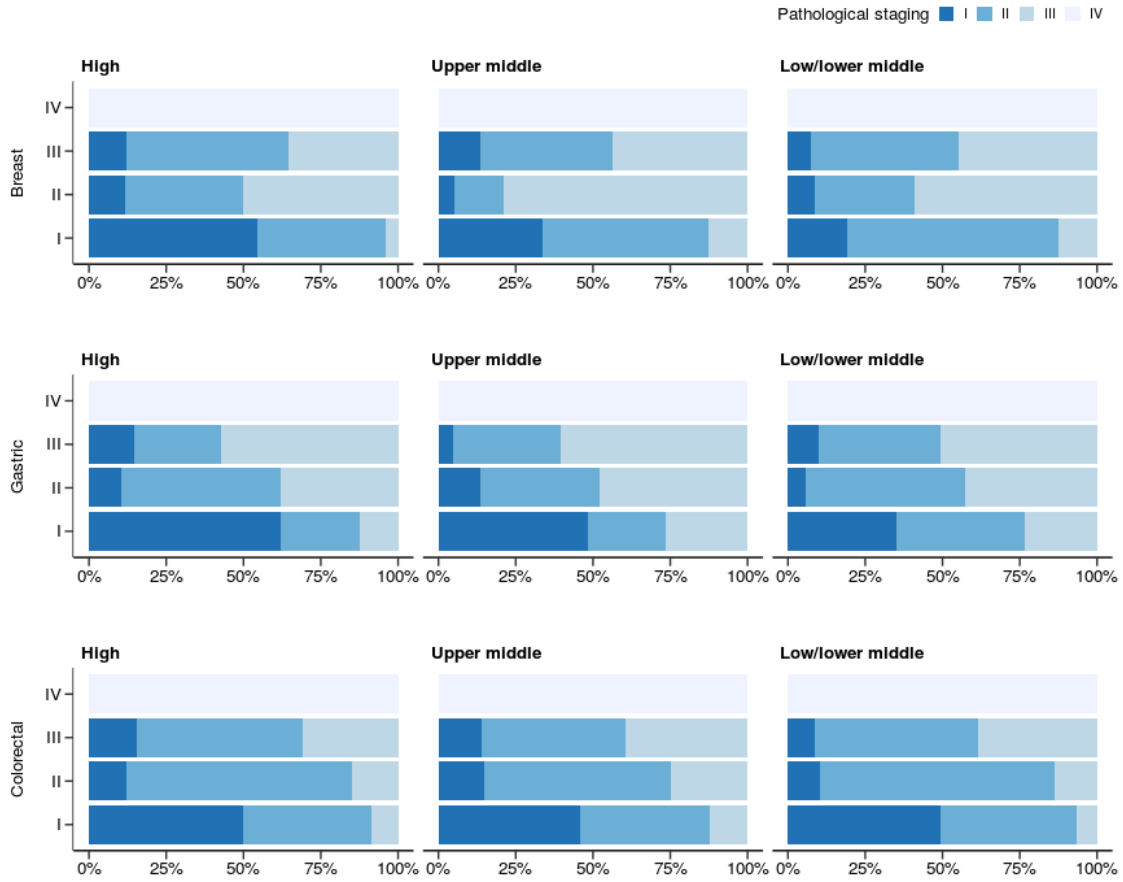
		L N=450	A N=235	R+ N=505	M+ N=133	p
Age (years)	Mean (SD)	64.6 (14.4)	62.7 (14.2)	63.1 (13.0)	61.2 (13.8)	0.068
Sex	Male	251 (55.8)	152 (64.7)	317 (62.8)	86 (64.7)	0.048
	Female	199 (44.2)	83 (35.3)	188 (37.2)	47 (35.3)	
ASA	I	66 (15.0)	38 (16.3)	101 (20.4)	23 (17.7)	<0.001
	II	222 (50.5)	110 (47.2)	242 (48.8)	60 (46.2)	
	III	142 (32.3)	78 (33.5)	140 (28.2)	34 (26.2)	
	IV	10 (2.3)	7 (3.0)	12 (2.4)	10 (7.7)	
	V	0 (0.0)	0 (0.0)	1 (0.2)	3 (2.3)	
BMI	Normal weight (BMI 18.5 to 24.9)	203 (47.9)	107 (48.6)	263 (54.0)	69 (54.8)	<0.001
	Underweight (BMI < 18.5)	25 (5.9)	21 (9.5)	55 (11.3)	22 (17.5)	
	Overweight (BMI 25 to 30)	134 (31.6)	79 (35.9)	122 (25.1)	29 (23.0)	
	Obese (BMI >30)	62 (14.6)	13 (5.9)	47 (9.7)	6 (4.8)	
>10% weight loss	No	285 (70.2)	104 (48.4)	202 (43.0)	33 (26.6)	<0.001
	Yes	121 (29.8)	111 (51.6)	268 (57.0)	91 (73.4)	
ECOG performance status	0	241 (55.5)	103 (45.2)	216 (43.7)	42 (32.3)	<0.001
	1	117 (27.0)	85 (37.3)	176 (35.6)	44 (33.8)	
	2	53 (12.2)	27 (11.8)	70 (14.2)	23 (17.7)	
	3	20 (4.6)	12 (5.3)	27 (5.5)	19 (14.6)	
	4	3 (0.7)	1 (0.4)	5 (1.0)	2 (1.5)	
Smoking	No, never	241 (62.0)	124 (57.4)	269 (59.1)	65 (58.6)	0.948
	Stopped >6 weeks ago	86 (22.1)	55 (25.5)	106 (23.3)	26 (23.4)	
	Yes, current smoker	62 (15.9)	37 (17.1)	80 (17.6)	20 (18.0)	
Diabetes	No	376 (85.3)	196 (85.2)	417 (84.2)	108 (81.8)	0.962
	Diet	8 (1.8)	5 (2.2)	9 (1.8)	1 (0.8)	
	Medication (non-insulin)	41 (9.3)	20 (8.7)	50 (10.1)	16 (12.1)	
HIV tested	Insulin	16 (3.6)	9 (3.9)	19 (3.8)	7 (5.3)	0.001
	No	363 (80.7)	162 (68.9)	364 (72.1)	85 (63.9)	
	Yes - Negative	86 (19.1)	73 (31.1)	140 (27.7)	47 (35.3)	
Distance to home (km)	Yes - Positive	1 (0.2)	0 (0.0)	1 (0.2)	1 (0.8)	0.002
	< 10 km	136 (32.9)	53 (24.5)	122 (25.7)	25 (20.7)	
	10-20 km	89 (21.5)	41 (19.0)	87 (18.4)	26 (21.5)	
	20-50 km	75 (18.1)	40 (18.5)	106 (22.4)	24 (19.8)	
	50-100 km	51 (12.3)	26 (12.0)	40 (8.4)	10 (8.3)	
Mode of diagnosis	>100 km	63 (15.2)	56 (25.9)	119 (25.1)	36 (29.8)	<0.001
	Symptomatic	340 (76.7)	221 (95.7)	475 (95.4)	130 (97.7)	
	Screening	31 (7.0)	1 (0.4)	7 (1.4)	1 (0.8)	
	Detected incidentally	72 (16.3)	9 (3.9)	16 (3.2)	2 (1.5)	
Urgency	Elective	436 (96.9)	220 (93.6)	474 (93.9)	113 (85.0)	<0.001
	Emergency	14 (3.1)	15 (6.4)	31 (6.1)	20 (15.0)	
Treatment intent	Palliative	17 (3.8)	23 (9.8)	65 (12.9)	89 (66.9)	<0.001
	Curative	433 (96.2)	212 (90.2)	440 (87.1)	44 (33.1)	
WHO checklist	No, not available in this hospital	49 (11.3)	31 (13.4)	48 (9.8)	10 (7.9)	0.114
	No, but available in this hospital	18 (4.1)	20 (8.7)	24 (4.9)	8 (6.3)	
	Yes	367 (84.6)	180 (77.9)	417 (85.3)	108 (85.7)	
Primary procedure	T309 Abdomen: Laparotomy with no other procedure	7 (1.6)	4 (1.7)	13 (2.6)	13 (9.8)	<0.001
	T43 Abdomen: Diagnostic laparoscopy with no other procedure	7 (1.6)	6 (2.6)	9 (1.8)	5 (3.8)	
	G27 Stomach: Total excision of stomach	131 (29.1)	93 (39.6)	214 (42.4)	30 (22.6)	
	G28 Stomach: Partial excision of stomach	265 (58.9)	102 (43.4)	207 (41.0)	36 (27.1)	
	G32 Stomach: Connection of stomach to jejunum	17 (3.8)	20 (8.5)	42 (8.3)	35 (26.3)	
	G38 Stomach: Other open operations on stomach	23 (5.1)	10 (4.3)	20 (4.0)	14 (10.5)	
	Open	280 (62.5)	182 (77.8)	413 (81.8)	117 (88.0)	
Approach	Minimally invasive	168 (37.5)	52 (22.2)	92 (18.2)	16 (12.0)	<0.001
	Upper third (cardia/fundus)	87 (19.7)	39 (17.1)	109 (22.0)	25 (19.8)	
	Middle third (body)	104 (23.5)	39 (17.1)	90 (18.2)	20 (15.9)	
	Distal third (antrum/pylorus)	195 (44.1)	109 (47.8)	210 (42.4)	56 (44.4)	
Site	Entire stomach	56 (12.7)	41 (18.0)	86 (17.4)	25 (19.8)	<0.001
	Not performed	83 (18.9)	29 (12.8)	38 (7.7)	28 (21.7)	
	Handsewn	116 (26.4)	81 (35.7)	152 (30.9)	54 (41.9)	
Anastomosis	Stapled	241 (54.8)	117 (51.5)	302 (61.4)	47 (36.4)	<0.001
	No	205 (49.0)	97 (43.3)	166 (34.2)	87 (69.6)	
	Yes	213 (51.0)	127 (56.7)	320 (65.8)	38 (30.4)	
D2 resection	No	409 (93.4)	200 (87.0)	421 (84.7)	71 (55.9)	<0.001
	Yes	29 (6.6)	30 (13.0)	76 (15.3)	56 (44.1)	
Pre-op obstruction	No	436 (98.9)	223 (96.5)	477 (95.8)	120 (91.6)	0.001
	Yes	5 (1.1)	8 (3.5)	21 (4.2)	11 (8.4)	

Essential TNM Classification of Malignant Tumours (eTNM), as defined by the Union for International Cancer Control (UICC), for gastric cancer:

L, Tumour contained within stomach wall with no nodal involvement (Stage I); A, Tumour through stomach wall with no nodal involvement (Stage II); R+, Regional lymph node involvement (Stage III); M+, Metastases present (Stage IV). ASA, American Society of Anesthesiologists operative risk grade; BMI, body mass index; ECOG, Eastern Cooperative Oncology Group; HIV, human immunodeficiency virus; SD, standard deviation. Data are n (%).



**Figure S6A. Comparison between preoperative clinical and postoperative final pathological staging.**



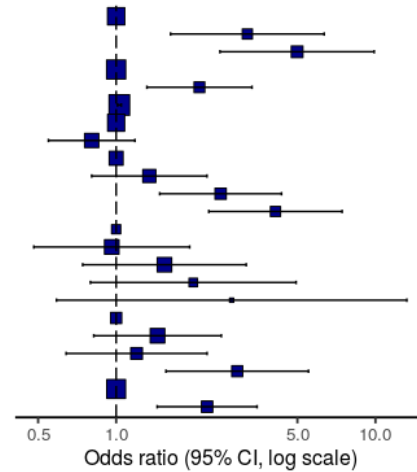
Preoperative clinical staging performed using Essential TNM Classification of Malignant Tumours (eTNM), as defined by the Union for International Cancer Control (UICC).

**Figure S6B. Capacity to rescue from major complication: sensitivity analysis using postoperative final pathological staging. A, multilevel logistic regression model for predictors of death after major complication in colorectal and gastric cancer. B, proportion of 30-day mortality variation explained at the level of patient/disease, hospital, country, and country income group, in patients with colorectal or gastric cancer who died after major complication. The “variance explained” at each of the 4 levels of the model (marginal pseudo-R<sup>2</sup>) is expressed as a proportion of the total “variance explained” (conditional pseudo-R<sup>2</sup>).**

Sensitivity analysis using pathological staging  
Colorectal and gastric cancer

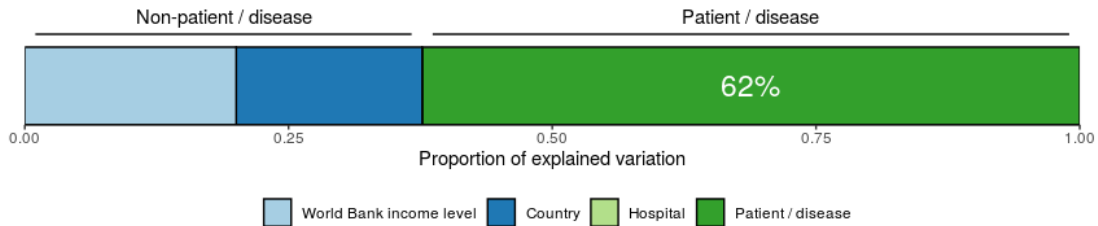
A. Predictors of death after major complication

WB income (tertile)	High	-
	Upper middle	3.21 (1.62-6.34, p=0.001)
	Low/lower middle	4.99 (2.51-9.89, p<0.001)
Cancer type	Colorectal	-
	Gastric	2.09 (1.31-3.34, p=0.002)
Age (years)	-	1.03 (1.01-1.05, p=0.001)
Sex	Male	-
	Female	0.80 (0.55-1.18, p=0.268)
ECOG performance status	0	-
	1	1.34 (0.80-2.24, p=0.260)
	2	2.53 (1.47-4.34, p=0.001)
	3/4	4.12 (2.28-7.44, p<0.001)
ASA	I	-
	II	0.96 (0.48-1.92, p=0.911)
	III	1.54 (0.74-3.17, p=0.247)
	IV	1.98 (0.80-4.94, p=0.142)
	V	2.79 (0.59-13.21, p=0.196)
Pathological stage	I	-
	II	1.44 (0.82-2.55, p=0.204)
	III	1.20 (0.64-2.24, p=0.570)
	IV	2.93 (1.56-5.52, p=0.001)
Urgency	Elective	-
	Emergency	2.24 (1.44-3.50, p<0.001)



B. Capacity to rescue from major complication

Components of variation



**Table S4A. Surgical procedure (breast).**

		High N=4220	Upper middle N=1319	Low/lower middle N=2867
Mode of diagnosis	Symptomatic	2073 (49.1)	935 (70.9)	2397 (83.6)
	Screening	1831 (43.4)	177 (13.4)	115 (4.0)
	Detected incidentally	243 (5.8)	196 (14.9)	338 (11.8)
	(Missing)	73 (1.7)	11 (0.8)	17 (0.6)
Urgency	Elective	4200 (99.5)	1309 (99.2)	2842 (99.1)
	Emergency	19 (0.5)	10 (0.8)	22 (0.8)
	(Missing)	1 (0.0)	0 (0.0)	3 (0.1)
Treatment intent	Palliative	50 (1.2)	70 (5.3)	126 (4.4)
	Curative	4168 (98.8)	1249 (94.7)	2738 (95.5)
	(Missing)	2 (0.0)	0 (0.0)	3 (0.1)
WHO checklist	No, not available in this hospital	191 (4.5)	91 (6.9)	314 (11.0)
	No, but available in this hospital	206 (4.9)	76 (5.8)	164 (5.7)
	Yes	3616 (85.7)	1138 (86.3)	2358 (82.2)
	(Missing)	207 (4.9)	14 (1.1)	31 (1.1)
Primary procedure	B27 Mastectomy	1257 (29.8)	869 (65.9)	1658 (57.8)
	B28 Partial mastectomy / wide local excision / lumpectomy	2766 (65.5)	370 (28.1)	1109 (38.7)
	B32 Open biopsy of breast	58 (1.4)	22 (1.7)	16 (0.6)
	B37 Other operations on breast	137 (3.2)	57 (4.3)	78 (2.7)
	(Missing)	2 (0.0)	1 (0.1)	6 (0.2)
	SNLB	No, not available in this hospital	33 (0.8)	279 (21.2)
	No, but available in this hospital	1021 (24.2)	503 (38.1)	1690 (58.9)
	Yes, single technique	1656 (39.2)	301 (22.8)	504 (17.6)
	Yes, dual technique	1446 (34.3)	206 (15.6)	192 (6.7)
	(Missing)	64 (1.5)	30 (2.3)	178 (6.2)
Axillary lymph node dissection	No	3177 (75.3)	479 (36.3)	770 (26.9)
	Yes	998 (23.6)	820 (62.2)	1989 (69.4)
	(Missing)	45 (1.1)	20 (1.5)	108 (3.8)
Margin check	No, not available in this hospital	199 (4.7)	289 (21.9)	246 (8.6)
	No, but available in this hospital	1664 (39.4)	562 (42.6)	1840 (64.2)
	Yes, by x-ray	1412 (33.5)	17 (1.3)	58 (2.0)
	Yes, by frozen section	678 (16.1)	416 (31.5)	624 (21.8)
	(Missing)	267 (6.3)	35 (2.7)	99 (3.5)
Primary reconstruction	No, not available in this hospital	190 (4.5)	243 (18.4)	260 (9.1)
	No, but available in this hospital	3170 (75.1)	816 (61.9)	2256 (78.7)
	Yes, immediate - prosthesis	243 (5.8)	118 (8.9)	41 (1.4)
	Yes, immediate - flap	466 (11.0)	125 (9.5)	202 (7.0)
	Yes, planned at later stage	146 (3.5)	16 (1.2)	105 (3.7)
	(Missing)	5 (0.1)	1 (0.1)	3 (0.1)

WHO, World Health Organisation; SNLB, sentinel lymph node biopsy. Data are n (%).

**Table S4B. Surgical procedure (colorectal).**

		<b>High N=4174</b>	<b>Upper middle N=1113</b>	<b>Low/lower middle N=928</b>
Mode of diagnosis	Symptomatic	2939 (70.4)	1012 (90.9)	887 (95.6)
	Screening	841 (20.1)	43 (3.9)	10 (1.1)
	Detected incidentally	334 (8.0)	52 (4.7)	26 (2.8)
	(Missing)	60 (1.4)	6 (0.5)	5 (0.5)
Urgency	Elective	3644 (87.3)	952 (85.5)	773 (83.3)
	Emergency	530 (12.7)	161 (14.5)	155 (16.7)
Treatment intent	Palliative	367 (8.8)	177 (15.9)	165 (17.8)
	Curative	3807 (91.2)	936 (84.1)	763 (82.2)
WHO checklist	No, not available in this hospital	241 (5.8)	293 (26.3)	148 (15.9)
	No, but available in this hospital	152 (3.6)	43 (3.9)	89 (9.6)
	Yes	3649 (87.4)	755 (67.8)	673 (72.5)
	(Missing)	132 (3.2)	22 (2.0)	18 (1.9)
Primary procedure	T309 Abdomen: Laparotomy with no other procedure	12 (0.3)	4 (0.4)	13 (1.4)
	T43 Abdomen: Diagnostic laparoscopy with no other procedure	4 (0.1)	0 (0.0)	1 (0.1)
	G74 Small bowel: Formation of ileostomy only	26 (0.6)	15 (1.3)	5 (0.5)
	H04 Colon: Total excision of colon and rectum	25 (0.6)	10 (0.9)	14 (1.5)
	H05 Colon: Total excision of colon	77 (1.8)	23 (2.1)	20 (2.2)
	H06 Colon: Extended excision of right hemicolon	207 (5.0)	37 (3.3)	81 (8.7)
	H07 Colon: Excision of right hemicolon	1240 (29.7)	197 (17.7)	157 (16.9)
	H08 Colon: Excision of transverse colon	45 (1.1)	13 (1.2)	12 (1.3)
	H09 Colon: Excision of left hemicolon	300 (7.2)	81 (7.3)	69 (7.4)
	H10 Colon: Excision of sigmoid colon	436 (10.4)	150 (13.5)	132 (14.2)
	H11 Colon: Other excision of colon	97 (2.3)	13 (1.2)	13 (1.4)
	H15 Colon: Formation of any colonic stoma	105 (2.5)	47 (4.2)	67 (7.2)
	H19 Colon: Other open operations on colon	49 (1.2)	32 (2.9)	7 (0.8)
	H331 Rectum: Abdominoperineal resection	260 (6.2)	97 (8.7)	114 (12.3)
	H332 Rectum: Resection with anastomosis of colon to anus	114 (2.7)	43 (3.9)	38 (4.1)
	H333 Rectum: Anterior resection with anastomosis	865 (20.7)	274 (24.6)	125 (13.5)
	H335 Rectum: Resection with closure of rectal stump (Hartmann's)	196 (4.7)	59 (5.3)	42 (4.5)
	H46 Rectum: Other open operations on rectum	115 (2.8)	17 (1.5)	16 (1.7)
	Approach	(Missing)	1 (0.0)	1 (0.1)
Open		1729 (41.4)	681 (61.2)	654 (70.5)
Laparoscopic (+/- open specimen extraction)		2092 (50.1)	363 (32.6)	233 (25.1)
Laparoscopic converted to open		213 (5.1)	46 (4.1)	39 (4.2)
Robotic		113 (2.7)	22 (2.0)	0 (0.0)
Robotic converted to open		2 (0.0)	0 (0.0)	0 (0.0)
(Missing)		25 (0.6)	1 (0.1)	2 (0.2)
Site	Caecum	494 (11.8)	82 (7.4)	72 (7.8)
	Ascending colon	832 (19.9)	152 (13.7)	153 (16.5)
	Transverse colon	319 (7.6)	65 (5.8)	63 (6.8)
	Descending colon	273 (6.5)	77 (6.9)	80 (8.6)
	Sigmoid colon	830 (19.9)	274 (24.6)	212 (22.8)
	High rectum (>10 to 15 cm)	473 (11.3)	156 (14.0)	93 (10.0)
	Middle rectum (>5 to 10 cm)	411 (9.8)	134 (12.0)	70 (7.5)
	Low rectum (<=5 cm from anal verge)	505 (12.1)	158 (14.2)	173 (18.6)
	(Missing)	37 (0.9)	15 (1.3)	12 (1.3)
	Anastomosis	Not performed	872 (20.9)	293 (26.3)
Handsewn		664 (15.9)	222 (19.9)	296 (31.9)
Stapled		2555 (61.2)	575 (51.7)	319 (34.4)
(Missing)		83 (2.0)	23 (2.1)	48 (5.2)
Pre-op obstruction	No	3366 (80.6)	836 (75.1)	656 (70.7)
	Yes	653 (15.6)	260 (23.4)	242 (26.1)
	(Missing)	155 (3.7)	17 (1.5)	30 (3.2)
Pre-op perforation	No	3891 (93.2)	1028 (92.4)	852 (91.8)
	Yes	228 (5.5)	69 (6.2)	46 (5.0)
	(Missing)	55 (1.3)	16 (1.4)	30 (3.2)
Stoma formed	No	2750 (65.9)	561 (50.4)	460 (49.6)
	Yes, loop ileostomy	512 (12.3)	196 (17.6)	123 (13.3)
	Yes, end ileostomy	130 (3.1)	53 (4.8)	31 (3.3)
	Yes, loop colostomy	161 (3.9)	82 (7.4)	92 (9.9)
	Yes, end colostomy	597 (14.3)	204 (18.3)	193 (20.8)
	(Missing)	24 (0.6)	17 (1.5)	29 (3.1)

WHO, World Health Organisation. Data are n (%).

**Table S4C. Surgical procedure (gastric).**

		High N=712	Upper middle N=289	Low/lower middle N=336
Mode of diagnosis	Symptomatic	577 (81.0)	272 (94.1)	326 (97.0)
	Screening	35 (4.9)	5 (1.7)	1 (0.3)
	Detected incidentally	85 (11.9)	9 (3.1)	7 (2.1)
Urgency	(Missing)	15 (2.1)	3 (1.0)	2 (0.6)
	Elective	681 (95.6)	273 (94.5)	300 (89.3)
	Emergency	30 (4.2)	16 (5.5)	36 (10.7)
Treatment intent	(Missing)	1 (0.1)	0 (0.0)	0 (0.0)
	Palliative	79 (11.1)	45 (15.6)	71 (21.1)
	Curative	632 (88.8)	244 (84.4)	265 (78.9)
WHO checklist	(Missing)	1 (0.1)	0 (0.0)	0 (0.0)
	No, not available in this hospital	65 (9.1)	38 (13.1)	35 (10.4)
	No, but available in this hospital	32 (4.5)	3 (1.0)	37 (11.0)
Primary procedure	Yes	579 (81.3)	243 (84.1)	261 (77.7)
	(Missing)	36 (5.1)	5 (1.7)	3 (0.9)
	T309 Abdomen: Laparotomy with no other procedure	12 (1.7)	11 (3.8)	14 (4.2)
Approach	T43 Abdomen: Diagnostic laparoscopy with no other procedure	14 (2.0)	8 (2.8)	6 (1.8)
	G27 Stomach: Total excision of stomach	269 (37.8)	117 (40.5)	84 (25.0)
	G28 Stomach: Partial excision of stomach	338 (47.5)	126 (43.6)	154 (45.8)
	G32 Stomach: Connection of stomach to jejunum	52 (7.3)	18 (6.2)	46 (13.7)
	G38 Stomach: Other open operations on stomach	26 (3.7)	9 (3.1)	32 (9.5)
	(Missing)	1 (0.1)	0 (0.0)	0 (0.0)
	Open	435 (61.1)	225 (77.9)	284 (84.5)
Site	Laparoscopic (+/- open specimen extraction)	242 (34.0)	49 (17.0)	28 (8.3)
	Laparoscopic converted to open	23 (3.2)	12 (4.2)	24 (7.1)
	Robotic	8 (1.1)	3 (1.0)	0 (0.0)
Anastomosis	Robotic converted to open	0 (0.0)	0 (0.0)	0 (0.0)
	(Missing)	4 (0.6)	0 (0.0)	0 (0.0)
	Upper third (cardia/fundus)	142 (19.9)	45 (15.6)	73 (21.7)
D2 resection	Middle third (body)	172 (24.2)	49 (17.0)	34 (10.1)
	Distal third (antrum/pylorus)	291 (40.9)	120 (41.5)	167 (49.7)
	Entire stomach	95 (13.3)	67 (23.2)	49 (14.6)
Pre-op obstruction	(Missing)	12 (1.7)	8 (2.8)	13 (3.9)
	Not performed	106 (14.9)	31 (10.7)	44 (13.1)
	Handsewn	146 (20.5)	86 (29.8)	172 (51.2)
Pre-op perforation	Stapled	448 (62.9)	162 (56.1)	106 (31.5)
	(Missing)	12 (1.7)	10 (3.5)	14 (4.2)
	No	309 (43.4)	92 (31.8)	156 (46.4)
Pre-op obstruction	Yes	369 (51.8)	185 (64.0)	154 (45.8)
	(Missing)	34 (4.8)	12 (4.2)	26 (7.7)
	No	619 (86.9)	254 (87.9)	239 (71.1)
Pre-op perforation	Yes	81 (11.4)	29 (10.0)	83 (24.7)
	(Missing)	12 (1.7)	6 (2.1)	14 (4.2)
	No	683 (95.9)	278 (96.2)	307 (91.4)
Pre-op obstruction	Yes	24 (3.4)	8 (2.8)	14 (4.2)
	(Missing)	5 (0.7)	3 (1.0)	15 (4.5)
	No	683 (95.9)	278 (96.2)	307 (91.4)

WHO, World Health Organisation. Data are n (%).

**Table S5. Detailed outcomes stratified by cancer and country income level.**

		Breast High	Breast Upper middle	Breast Low/lower middle	Colorectal High	Colorectal Upper middle	Colorectal Low/lower middle	Gastric High	Gastric Upper middle	Gastric Low/lower middle
		N=4220	N=1319	N=2867	N=4174	N=1113	N=928	N=712	N=289	N=336
30-day mortality	Alive	4203 (99.6)	1293 (98.0)	2822 (98.4)	4048 (97.0)	1055 (94.8)	842 (90.7)	675 (94.8)	272 (94.1)	293 (87.2)
	Dead (Missing)	4 (0.1) 13 (0.3)	2 (0.2) 24 (1.8)	10 (0.3) 35 (1.2)	94 (2.3) 32 (0.8)	47 (4.2) 11 (1.0)	63 (6.8) 23 (2.5)	27 (3.8) 10 (1.4)	11 (3.8) 6 (2.1)	33 (9.8) 10 (3.0)
Minor complication (CD1)	No	3122 (74.0)	901 (68.3)	1897 (66.2)	2875 (68.9)	772 (69.4)	556 (59.9)	518 (72.8)	171 (59.2)	215 (64.0)
	Yes (Missing)	1069 (25.3) 29 (0.7)	392 (29.7) 26 (2.0)	923 (32.2) 47 (1.6)	1252 (30.0) 47 (1.1)	321 (28.8) 20 (1.8)	339 (36.5) 33 (3.6)	188 (26.4) 6 (0.8)	112 (38.8) 6 (2.1)	103 (30.7) 18 (5.4)
Minor complication (CD2)	No	3908 (92.6)	1137 (86.2)	2388 (83.3)	3106 (74.4)	884 (79.4)	601 (64.8)	538 (75.6)	202 (69.9)	237 (70.5)
	Yes (Missing)	283 (6.7) 29 (0.7)	156 (11.8) 26 (2.0)	426 (14.9) 53 (1.8)	1026 (24.6) 42 (1.0)	210 (18.9) 19 (1.7)	292 (31.5) 35 (3.8)	169 (23.7) 5 (0.7)	81 (28.0) 6 (2.1)	82 (24.4) 17 (5.1)
Re-intervention (CD3)	No	3990 (94.5)	1248 (94.6)	2571 (89.7)	3672 (88.0)	1016 (91.3)	777 (83.7)	632 (88.8)	267 (92.4)	292 (86.9)
	Yes, NOT under general anaesthetic	71 (1.7)	19 (1.4)	140 (4.9)	135 (3.2)	25 (2.2)	46 (5.0)	31 (4.4)	6 (2.1)	12 (3.6)
Life-threatening complication (CD4)	Yes, under general anaesthetic (Missing)	142 (3.4) 17 (0.4)	31 (2.4) 21 (1.6)	63 (2.2) 93 (3.2)	333 (8.0) 34 (0.8)	53 (4.8) 19 (1.7)	70 (7.5) 35 (3.8)	45 (6.3) 4 (0.6)	10 (3.5) 6 (2.1)	17 (5.1) 15 (4.5)
	No	4195 (99.4)	1280 (97.0)	2803 (97.8)	3902 (93.5)	1042 (93.6)	818 (88.1)	662 (93.0)	264 (91.3)	289 (86.0)
Readmission	Yes, single organ failure (Missing)	3 (0.1) 19 (0.5)	14 (1.1) 22 (1.7)	5 (0.2) 56 (2.0)	138 (3.3) 39 (0.9)	24 (2.2) 17 (1.5)	40 (4.3) 30 (3.2)	23 (3.2) 3 (0.4)	9 (3.1) 6 (2.1)	16 (4.8) 16 (4.8)
	Yes, multi organ failure (Missing)	3 (0.1) 4034 (95.6)	3 (0.2) 1247 (94.5)	3 (0.1) 2778 (96.9)	95 (2.3) 3828 (91.7)	30 (2.7) 1012 (90.9)	40 (4.3) 799 (86.1)	24 (3.4) 661 (92.8)	10 (3.5) 252 (87.2)	15 (4.5) 295 (87.8)
Surgical site infection	No	171 (4.1) 15 (0.4)	52 (3.9) 20 (1.5)	42 (1.5) 47 (1.6)	310 (7.4) 36 (0.9)	86 (7.7) 15 (1.3)	99 (10.7) 30 (3.2)	47 (6.6) 4 (0.6)	31 (10.7) 6 (2.1)	25 (7.4) 16 (4.8)
	Yes, no treatment/wound opened only (CD 1)	3878 (91.9)	1144 (86.7)	2346 (81.8)	3562 (85.3)	893 (80.2)	615 (66.3)	637 (89.5)	221 (76.5)	271 (80.7)
Abscess (OSI)	Yes, antibiotics only (CD 2)	54 (1.3)	61 (4.6)	141 (4.9)	177 (4.2)	81 (7.3)	75 (8.1)	22 (3.1)	22 (7.6)	16 (4.8)
	Yes, return to operating theatre (CD 3)	168 (4.0)	77 (5.8)	205 (7.2)	261 (6.3)	85 (7.6)	156 (16.8)	34 (4.8)	36 (12.5)	22 (6.5)
Anastomotic leak	Yes, requiring critical care admission (CD 4)	27 (0.6)	9 (0.7)	91 (3.2)	76 (1.8)	26 (2.3)	30 (3.2)	5 (0.7)	2 (0.7)	6 (1.8)
	Yes, resulting in death (CD 5) (Missing)	0 (0.0) 93 (2.2)	0 (0.0) 28 (2.1)	2 (0.1) 81 (2.8)	15 (0.4) 80 (1.9)	8 (0.7) 16 (1.4)	4 (0.4) 42 (4.5)	3 (0.4) 9 (1.3)	0 (0.0) 7 (2.4)	3 (0.9) 18 (5.4)
Anastomotic leak	Yes, no intervention required (CD 1)	0 (0.0)	0 (0.0)	1 (0.0)	3 (0.1)	4 (0.4)	6 (0.6)	2 (0.3)	1 (0.3)	0 (0.0)
	Yes, drug treatment only (CD 2)	0 (0.0)	0 (0.0)	1 (0.0)	3 (0.1)	4 (0.4)	6 (0.6)	2 (0.3)	1 (0.3)	0 (0.0)
Anastomotic leak	Yes, resulting in death (CD 5) (Missing)	93 (2.2)	28 (2.1)	81 (2.8)	80 (1.9)	16 (1.4)	42 (4.5)	9 (1.3)	7 (2.4)	18 (5.4)
	No	3857 (91.9)	1144 (86.7)	2346 (81.8)	3562 (85.3)	893 (80.2)	615 (66.3)	637 (89.5)	221 (76.5)	271 (80.7)
Anastomotic leak	Yes, no intervention required (CD 1)	20 (0.5)	2 (0.2)	6 (0.6)	2 (0.3)	3 (0.4)	0 (0.0)	3 (0.9)	0 (0.0)	3 (0.9)
	Yes, critical care admission (CD 4)	78 (1.9)	19 (1.7)	14 (1.5)	14 (2.0)	10 (3.5)	4 (1.2)	4 (1.2)	10 (3.5)	4 (1.2)
Anastomotic leak	Yes, resulting in death (CD 5) (Missing)	114 (2.7)	22 (2.0)	21 (2.3)	28 (3.9)	5 (1.7)	6 (1.8)	5 (1.7)	6 (1.8)	6 (1.8)
	Yes, drug treatment only (CD 2)	22 (0.5)	5 (0.4)	4 (0.4)	2 (0.3)	1 (0.3)	1 (0.3)	1 (0.3)	1 (0.3)	1 (0.3)
Anastomotic leak	Yes, intervention required (CD 3)	12 (0.3)	4 (0.4)	4 (0.4)	3 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	No	71 (1.7)	22 (2.0)	74 (8.0)	9 (1.3)	8 (2.8)	24 (7.1)	292 (86.9)	292 (86.9)	292 (86.9)
Anastomotic leak	Yes, no intervention required (CD 1)	18 (0.4)	8 (0.7)	24 (2.6)	4 (0.6)	1 (0.3)	5 (1.5)	1 (0.3)	5 (1.5)	5 (1.5)
	Yes, drug treatment only (CD 2)	41 (1.0)	7 (0.6)	2 (0.2)	7 (1.0)	2 (0.7)	2 (0.6)	2 (0.7)	2 (0.7)	2 (0.6)
Anastomotic leak	Yes, intervention required (CD 3)	104 (2.5)	19 (1.7)	24 (2.6)	18 (2.5)	3 (1.0)	9 (2.7)	3 (1.0)	9 (2.7)	9 (2.7)

	Yes, critical care admission &/or intervention (CD 4)				61 (1.5)	8 (0.7)	7 (0.8)	7 (1.0)	3 (1.0)	7 (2.1)
	Yes, resulting in death (CD 5)				11 (0.3)	5 (0.4)	3 (0.3)	3 (0.4)	2 (0.7)	0 (0.0)
	(Missing)				23 (0.6)	14 (1.3)	32 (3.4)	3 (0.4)	7 (2.4)	21 (6.2)
Post-operative bleed	No	4015 (95.1)	1208 (91.6)	2752 (96.0)	3941 (94.4)	1041 (93.5)	856 (92.2)	671 (94.2)	237 (82.0)	302 (89.9)
	Yes, no intervention required (CD 1)	102 (2.4)	74 (5.6)	45 (1.6)	56 (1.3)	35 (3.1)	17 (1.8)	8 (1.1)	27 (9.3)	5 (1.5)
	Yes, transfusion only (CD 2)	8 (0.2)	1 (0.1)	13 (0.5)	87 (2.1)	18 (1.6)	10 (1.1)	15 (2.1)	13 (4.5)	2 (0.6)
	Yes, surgical/radiological intervention required (CD 3)	61 (1.4)	12 (0.9)	17 (0.6)	38 (0.9)	5 (0.4)	7 (0.8)	5 (0.7)	0 (0.0)	2 (0.6)
	Yes, critical care admission &/or intervention (CD 4)	0 (0.0)	1 (0.1)	0 (0.0)	10 (0.2)	3 (0.3)	6 (0.6)	6 (0.8)	3 (1.0)	5 (1.5)
	Yes, resulting in death (CD 5)	0 (0.0)	0 (0.0)	1 (0.0)	4 (0.1)	2 (0.2)	3 (0.3)	3 (0.4)	1 (0.3)	2 (0.6)
	(Missing)	34 (0.8)	23 (1.7)	39 (1.4)	38 (0.9)	9 (0.8)	29 (3.1)	4 (0.6)	8 (2.8)	18 (5.4)
Seroma	No	3340 (79.1)	1039 (78.8)	2040 (71.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Yes, no intervention/aspiration only (CD 1)	653 (15.5)	206 (15.6)	552 (19.3)						
	Yes, antibiotic treatment only (CD 2)	45 (1.1)	33 (2.5)	35 (1.2)						
	Yes, intervention required (CD 3)	62 (1.5)	9 (0.7)	62 (2.2)						
	Yes, critical care admission &/or intervention (CD 4)	0 (0.0)	0 (0.0)	0 (0.0)						
	Yes, resulting in death (CD 5)	0 (0.0)	0 (0.0)	0 (0.0)						
	(Missing)	120 (2.8)	32 (2.4)	178 (6.2)						
Length of Stay (days)	Mean (SD)	1.8 (2.3)	3.1 (3.1)	2.7 (3.7)	10.1 (8.8)	8.9 (6.8)	9.0 (7.1)	12.0 (31.3)	9.9 (6.2)	10.3 (7.0)

CD, Clavien-Dindo complication grade. OSI, organ space infection.

**Table S6A. Breast cancer logistic regression analyses: 30-day mortality.**

Dependent: 30-day mortality		Alive	Dead	OR (univariable)	OR (multivariable)	OR (multivariable reduced)	OR (multilevel)
WB income (tertile)	High	4203 (99.9)	4 (0.1)	-	-	-	-
	Upper middle	1293 (99.8)	2 (0.2)	1.63 (0.23-8.34, p=0.575)	1.41 (0.17-8.66, p=0.721)	1.79 (0.24-9.76, p=0.518)	1.90 (0.07-50.90, p=0.702)
	Low/lower middle	2822 (99.6)	10 (0.4)	3.72 (1.24-13.58, p=0.026)	3.19 (0.75-15.53, p=0.127)	4.32 (1.18-18.27, p=0.033)	8.46 (0.66-108.04, p=0.100)
Age (years)	Mean (SD)	0.0 (1.0)	0.5 (1.0)	1.67 (1.02-2.77, p=0.042)	1.61 (0.88-3.09, p=0.138)	1.63 (0.92-2.99, p=0.105)	2.10 (1.03-4.28, p=0.041)
>10% weight loss	No	6815 (99.9)	10 (0.1)	-	-	-	-
	Yes	362 (99.5)	2 (0.5)	3.77 (0.58-14.35, p=0.088)	1.32 (0.17-6.34, p=0.758)	-	-
	(Missing)	1141 (99.7)	4 (0.3)	2.39 (0.65-7.16, p=0.142)	2.46 (0.53-8.65, p=0.192)	-	-
ECOG performance status	0	5276 (99.9)	4 (0.1)	-	-	-	-
	1	1688 (99.6)	6 (0.4)	4.69 (1.34-18.36, p=0.017)	2.79 (0.70-11.75, p=0.140)	3.55 (0.98-14.35, p=0.056)	4.34 (1.04-18.11, p=0.044)
	2	748 (99.9)	1 (0.1)	1.76 (0.09-11.94, p=0.612)	1.08 (0.05-7.79, p=0.946)	1.18 (0.06-8.37, p=0.883)	0.69 (0.05-9.63, p=0.782)
	3/4	172 (97.7)	4 (2.3)	30.67 (7.20-130.70, p<0.001)	11.02 (2.03-58.54, p=0.004)	11.16 (2.16-57.05, p=0.003)	15.38 (2.06-114.76, p=0.008)
Diabetes	No	6811 (99.8)	11 (0.2)	-	-	-	-
	Yes	1139 (99.7)	4 (0.3)	2.17 (0.60-6.37, p=0.184)	1.37 (0.35-4.44, p=0.617)	1.19 (0.32-3.71, p=0.775)	1.02 (0.24-4.39, p=0.975)
Urgency	Elective	8270 (99.8)	15 (0.2)	-	-	-	-
	Emergency	48 (98.0)	1 (2.0)	11.49 (0.63-58.43, p=0.019)	4.92 (0.23-33.88, p=0.179)	-	-
Treatment intent	Palliative	239 (98.4)	4 (1.6)	-	-	-	-
	Curative	8078 (99.9)	12 (0.1)	0.09 (0.03-0.32, p<0.001)	0.36 (0.08-1.90, p=0.196)	0.20 (0.06-0.83, p=0.016)	0.14 (0.03-0.63, p=0.011)
Stage	0	509 (99.8)	1 (0.2)	-	-	-	-
	I	4504 (99.9)	3 (0.1)	0.34 (0.04-6.86, p=0.349)	0.24 (0.03-4.97, p=0.226)	-	-
	II	134 (99.3)	1 (0.7)	3.80 (0.15-96.48, p=0.346)	1.39 (0.05-39.74, p=0.828)	-	-
	III	2859 (99.8)	6 (0.2)	1.07 (0.18-20.20, p=0.951)	0.66 (0.09-13.66, p=0.720)	-	-
	IV	271 (98.9)	3 (1.1)	5.63 (0.72-114.21, p=0.135)	1.03 (0.08-26.27, p=0.983)	-	-

OR, odds ratio; WB, World Bank; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.



**Table S6B. Breast cancer logistic regression analyses: major complication.**

Dependent: Major complication		No	Yes	OR	OR	OR	OR
				(univariable)	(multivariable)	(multivariable reduced)	(multilevel)
WB income (tertile)	High	3997 (94.8)	218 (5.2)	-	-	-	-
	Upper middle	1245 (95.3)	61 (4.7)	0.90 (0.67-1.19, p=0.470)	0.70 (0.50-0.97, p=0.038)	0.71 (0.51-0.97, p=0.038)	0.53 (0.31-0.90, p=0.018)
	Low/lower middle	2628 (92.4)	217 (7.6)	1.51 (1.25-1.84, p<0.001)	1.22 (0.93-1.60, p=0.147)	1.21 (0.94-1.56, p=0.134)	0.84 (0.53-1.35, p=0.479)
Age (years)	Mean (SD)	0.0 (1.0)	-0.1 (1.0)	0.94 (0.86-1.03, p=0.199)	0.90 (0.81-1.01, p=0.083)	0.91 (0.82-1.02, p=0.121)	0.92 (0.82-1.04, p=0.175)
BMI	Normal weight (BMI 18.5 to 24.9)	2633 (94.8)	145 (5.2)	-	-	-	-
	Underweight (BMI < 18.5)	154 (96.9)	5 (3.1)	0.59 (0.21-1.32, p=0.253)	0.49 (0.15-1.19, p=0.168)	0.51 (0.16-1.24, p=0.195)	0.53 (0.19-1.49, p=0.230)
	Overweight (BMI 25 to 30)	2689 (94.0)	171 (6.0)	1.15 (0.92-1.45, p=0.216)	1.18 (0.93-1.51, p=0.171)	1.18 (0.93-1.51, p=0.170)	1.23 (0.96-1.58, p=0.106)
	Obese (BMI >30)	1825 (92.7)	143 (7.3)	1.42 (1.12-1.81, p=0.004)	1.42 (1.09-1.85, p=0.008)	1.43 (1.10-1.85, p=0.007)	1.54 (1.16-2.04, p=0.003)
	(Missing)	569 (94.7)	32 (5.3)	1.02 (0.68-1.49, p=0.917)	1.43 (0.89-2.22, p=0.120)	1.38 (0.87-2.11, p=0.151)	1.48 (0.90-2.46, p=0.126)
>10% weight loss	No	6443 (94.0)	409 (6.0)	-	-	-	-
	Yes	340 (93.2)	25 (6.8)	1.16 (0.74-1.72, p=0.491)	1.26 (0.79-1.92, p=0.311)	-	-
	(Missing)	1087 (94.6)	62 (5.4)	0.90 (0.68-1.17, p=0.445)	0.94 (0.66-1.30, p=0.721)	-	-
ECOG performance status	0	4987 (94.1)	315 (5.9)	-	-	-	-
	1	1606 (94.6)	92 (5.4)	0.91 (0.71-1.15, p=0.423)	0.86 (0.66-1.11, p=0.255)	0.87 (0.67-1.12, p=0.293)	0.85 (0.65-1.12, p=0.253)
	2	706 (93.6)	48 (6.4)	1.08 (0.78-1.46, p=0.646)	0.91 (0.63-1.29, p=0.599)	0.91 (0.63-1.29, p=0.620)	1.02 (0.68-1.54, p=0.918)
	3/4	159 (90.3)	17 (9.7)	1.69 (0.98-2.75, p=0.044)	1.39 (0.74-2.44, p=0.274)	1.39 (0.74-2.40, p=0.270)	1.40 (0.74-2.65, p=0.296)
	(Missing)	434 (95.0)	23 (5.0)	0.82 (0.52-1.23, p=0.363)	0.98 (0.56-1.61, p=0.946)	-	-
Diabetes	No	6463 (94.4)	381 (5.6)	-	-	-	-
	Yes	1062 (92.3)	89 (7.7)	1.42 (1.11-1.80, p=0.004)	1.40 (1.07-1.81, p=0.014)	1.38 (1.05-1.79, p=0.017)	1.29 (0.98-1.70, p=0.070)
Mode of diagnosis	Symptomatic	5014 (93.3)	359 (6.7)	-	-	-	-
	Screening	2011 (94.9)	109 (5.1)	0.76 (0.60-0.94, p=0.013)	0.99 (0.76-1.30, p=0.961)	0.99 (0.76-1.29, p=0.945)	0.95 (0.71-1.25, p=0.693)
	Detected incidentally	750 (97.0)	23 (3.0)	0.43 (0.27-0.64, p<0.001)	0.42 (0.25-0.67, p=0.001)	0.42 (0.25-0.67, p=0.001)	0.46 (0.28-0.77, p=0.003)
Urgency	Elective	7827 (94.1)	488 (5.9)	-	-	-	-
	Emergency	43 (84.3)	8 (15.7)	2.98 (1.29-6.04, p=0.005)	2.69 (1.08-5.80, p=0.020)	2.77 (1.12-5.94, p=0.015)	2.58 (1.07-6.19, p=0.034)
Treatment intent	Palliative	227 (93.4)	16 (6.6)	-	-	-	-
	Curative	7642 (94.1)	480 (5.9)	0.89 (0.55-1.55, p=0.661)	1.15 (0.65-2.19, p=0.640)	-	-
Primary procedure	B27 Mastectomy	3465 (92.2)	293 (7.8)	-	-	-	-
	B28 Partial mastectomy / wide local excision / lumpectomy	4051 (95.6)	187 (4.4)	0.55 (0.45-0.66, p<0.001)	0.56 (0.45-0.70, p<0.001)	0.56 (0.45-0.70, p<0.001)	0.54 (0.43-0.68, p<0.001)
	B32 Open biopsy of breast	93 (97.9)	2 (2.1)	0.25 (0.04-0.81, p=0.056)	0.31 (0.05-1.01, p=0.108)	0.31 (0.05-0.99, p=0.103)	0.33 (0.08-1.40, p=0.133)
	B37 Other operations on breast	257 (95.2)	13 (4.8)	0.60 (0.32-1.02, p=0.077)	0.71 (0.38-1.21, p=0.243)	0.69 (0.37-1.19, p=0.212)	0.77 (0.42-1.41, p=0.395)
	(Missing)	491 (95.7)	22 (4.3)	-	-	-	-
Stage	0	491 (95.7)	22 (4.3)	-	-	-	-
	I	4270 (94.4)	252 (5.6)	1.32 (0.86-2.11, p=0.226)	1.15 (0.75-1.87, p=0.540)	-	-
	II	119 (88.1)	16 (11.9)	3.00 (1.51-5.86, p=0.001)	1.66 (0.75-3.50, p=0.193)	-	-
	III	2695 (93.7)	181 (6.3)	1.50 (0.97-2.42, p=0.080)	1.02 (0.64-1.69, p=0.936)	-	-

IV	253 (92.0)	22 (8.0)	1.94 (1.05-3.59, p=0.033)	1.25 (0.63-2.47, p=0.521)	-	-
----	------------	----------	------------------------------	------------------------------	---	---

OR, odds ratio; WB, World Bank; BMI, Body Mass Index; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.

**Table S6C. Breast cancer logistic regression analyses: all complications.**

Dependent: Any complication		No	Yes	OR (univariable)	OR (multivariable)	OR (multivariable reduced)	OR (multilevel)
WB income (tertile)	High	2869 (68.1)	1346 (31.9)	-	-	-	-
	Upper middle	829 (63.5)	477 (36.5)	1.23 (1.08-1.40, p=0.002)	0.98 (0.84-1.14, p=0.820)	0.99 (0.85-1.15, p=0.921)	1.13 (0.66-1.92, p=0.658)
	Low/lower middle	1644 (57.8)	1201 (42.2)	1.56 (1.41-1.72, p<0.001)	1.06 (0.93-1.22, p=0.377)	1.08 (0.94-1.24, p=0.288)	0.90 (0.54-1.51, p=0.688)
Age (years)	Mean (SD)	-0.0 (1.0)	0.0 (1.0)	1.06 (1.02-1.11, p=0.006)	1.09 (1.03-1.16, p=0.002)	1.09 (1.03-1.16, p=0.002)	1.07 (1.01-1.14, p=0.022)
ASA (>3)	No	5081 (64.6)	2784 (35.4)	-	-	-	-
	Yes	261 (52.1)	240 (47.9)	1.68 (1.40-2.01, p<0.001)	1.77 (1.33-2.35, p<0.001)	1.76 (1.32-2.32, p<0.001)	1.86 (1.30-2.66, p=0.001)
BMI	Normal weight (BMI 18.5 to 24.9)	1860 (67.0)	918 (33.0)	-	-	-	-
	Underweight (BMI < 18.5)	105 (66.0)	54 (34.0)	1.04 (0.74-1.45, p=0.811)	0.93 (0.64-1.34, p=0.709)	0.96 (0.66-1.37, p=0.824)	0.82 (0.55-1.21, p=0.322)
	Overweight (BMI 25 to 30)	1801 (63.0)	1059 (37.0)	1.19 (1.07-1.33, p=0.002)	1.09 (0.96-1.22, p=0.173)	1.08 (0.96-1.22, p=0.187)	1.16 (1.03-1.32, p=0.019)
	Obese (BMI >30)	1154 (58.6)	814 (41.4)	1.43 (1.27-1.61, p<0.001)	1.27 (1.11-1.44, p<0.001)	1.26 (1.10-1.43, p<0.001)	1.42 (1.22-1.65, p<0.001)
	(Missing)	422 (70.2)	179 (29.8)	0.86 (0.71-1.04, p=0.122)	0.82 (0.64-1.04, p=0.110)	0.80 (0.63-1.01, p=0.068)	1.07 (0.80-1.42, p=0.654)
>10% weight loss	No	4384 (64.0)	2468 (36.0)	-	-	-	-
	Yes	203 (55.6)	162 (44.4)	1.42 (1.15-1.75, p=0.001)	1.18 (0.93-1.49, p=0.163)	-	-
	(Missing)	755 (65.7)	394 (34.3)	0.93 (0.81-1.06, p=0.258)	0.88 (0.74-1.03, p=0.118)	-	-
ECOG performance status	0	3564 (67.2)	1738 (32.8)	-	-	-	-
	1	1007 (59.3)	691 (40.7)	1.41 (1.26-1.57, p<0.001)	1.21 (1.07-1.37, p=0.002)	1.22 (1.07-1.38, p=0.002)	1.26 (1.10-1.45, p=0.001)
	2	440 (58.4)	314 (41.6)	1.46 (1.25-1.71, p<0.001)	1.30 (1.10-1.55, p=0.003)	1.31 (1.10-1.56, p=0.002)	1.64 (1.32-2.04, p<0.001)
	3/4	83 (47.2)	93 (52.8)	2.30 (1.70-3.11, p<0.001)	1.74 (1.24-2.44, p=0.001)	1.75 (1.25-2.44, p=0.001)	1.82 (1.24-2.67, p=0.002)
Smoking	No	4588 (63.8)	2601 (36.2)	-	-	-	-
	Yes	461 (64.0)	259 (36.0)	0.99 (0.84-1.16, p=0.912)	1.23 (1.03-1.46, p=0.021)	1.23 (1.03-1.46, p=0.021)	1.32 (1.10-1.59, p=0.003)
	(Missing)	293 (64.1)	164 (35.9)	0.99 (0.81-1.20, p=0.899)	0.97 (0.74-1.24, p=0.785)	0.94 (0.73-1.21, p=0.631)	1.02 (0.77-1.36, p=0.869)
Diabetes	No	4506 (65.8)	2338 (34.2)	-	-	-	-
	Yes	672 (58.4)	479 (41.6)	1.37 (1.21-1.56, p<0.001)	1.14 (0.99-1.32, p=0.063)	1.15 (0.99-1.32, p=0.059)	1.05 (0.90-1.23, p=0.508)
Mode of diagnosis	Symptomatic	3292 (61.3)	2081 (38.7)	-	-	-	-
	Screening	1512 (71.3)	608 (28.7)	0.64 (0.57-0.71, p<0.001)	0.88 (0.77-1.00, p=0.047)	0.87 (0.76-0.99, p=0.040)	0.80 (0.69-0.92, p=0.002)
	Detected incidentally	468 (60.5)	305 (39.5)	1.03 (0.88-1.20, p=0.699)	1.00 (0.84-1.19, p=0.986)	1.00 (0.84-1.19, p=0.982)	0.87 (0.71-1.07, p=0.189)
Urgency	Elective	5316 (63.9)	2999 (36.1)	-	-	-	-
	Emergency	26 (51.0)	25 (49.0)	1.70 (0.98-2.96, p=0.058)	1.22 (0.67-2.20, p=0.503)	-	-
Treatment intent	Palliative	142 (58.4)	101 (41.6)	-	-	-	-
	Curative	5200 (64.0)	2922 (36.0)	0.79 (0.61-1.03, p=0.075)	1.04 (0.77-1.42, p=0.787)	-	-
Primary procedure	B27 Mastectomy	2077 (55.3)	1681 (44.7)	-	-	-	-
	B28 Partial mastectomy / wide local excision / lumpectomy	3004 (70.9)	1234 (29.1)	0.51 (0.46-0.56, p<0.001)	0.57 (0.52-0.64, p<0.001)	0.57 (0.52-0.64, p<0.001)	0.57 (0.51-0.64, p<0.001)
	B32 Open biopsy of breast	82 (86.3)	13 (13.7)	0.20 (0.10-0.34, p<0.001)	0.27 (0.14-0.48, p<0.001)	0.27 (0.14-0.47, p<0.001)	0.22 (0.11-0.42, p<0.001)
	B37 Other operations on breast	175 (64.8)	95 (35.2)	0.67 (0.52-0.87, p=0.002)	0.81 (0.62-1.07, p=0.143)	0.81 (0.62-1.07, p=0.145)	0.85 (0.62-1.17, p=0.317)
Stage	0	365 (71.2)	148 (28.8)	-	-	-	-
	I	3068 (67.8)	1454 (32.2)	1.17 (0.96-1.43, p=0.128)	1.01 (0.81-1.26, p=0.941)	1.01 (0.82-1.27, p=0.906)	0.98 (0.78-1.24, p=0.889)

II	68 (50.4)	67 (49.6)	2.43 (1.65-3.58, p<0.001)	1.37 (0.88-2.13, p=0.157)	1.39 (0.89-2.15, p=0.143)	1.29 (0.81-2.07, p=0.285)
III	1655 (57.5)	1221 (42.5)	1.82 (1.49-2.24, p<0.001)	1.27 (1.01-1.60, p=0.046)	1.28 (1.01-1.62, p=0.039)	1.31 (1.02-1.68, p=0.036)
IV	153 (55.6)	122 (44.4)	1.97 (1.45-2.67, p<0.001)	1.23 (0.87-1.75, p=0.238)	1.24 (0.89-1.73, p=0.208)	1.22 (0.85-1.75, p=0.278)

OR, odds ratio; WB, World Bank; BMI, Body Mass Index; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.

**Table S7A. Colorectal cancer logistic regression analyses: mortality.**

Dependent: 30-day mortality		Alive	Dead	OR (univariable)	OR (multivariable)	OR (multivariable reduced)	OR (multilevel)
WB income (tertile)	High	4048 (97.7)	94 (2.3)	-	-	-	-
	Upper middle	1055 (95.7)	47 (4.3)	1.92 (1.33-2.73, p<0.001)	2.11 (1.35-3.28, p=0.001)	2.20 (1.42-3.37, p<0.001)	2.06 (1.11-3.83, p=0.021)
	Low/lower middle	842 (93.0)	63 (7.0)	3.22 (2.31-4.46, p<0.001)	3.46 (2.13-5.62, p<0.001)	3.75 (2.37-5.93, p<0.001)	4.59 (2.39-8.80, p<0.001)
Age (years)	Mean (SD)	-0.0 (1.0)	0.4 (1.1)	1.53 (1.31-1.79, p<0.001)	1.61 (1.33-1.96, p<0.001)	1.65 (1.37-1.99, p<0.001)	1.69 (1.39-2.07, p<0.001)
Sex	Male	3316 (96.5)	119 (3.5)	-	-	-	-
	Female	2622 (96.9)	84 (3.1)	0.89 (0.67-1.18, p=0.433)	0.65 (0.46-0.92, p=0.015)	0.67 (0.48-0.94, p=0.020)	0.68 (0.48-0.96, p=0.028)
ASA (>3)	No	5626 (97.2)	164 (2.8)	-	-	-	-
	Yes	319 (88.9)	40 (11.1)	4.30 (2.96-6.13, p<0.001)	1.82 (1.11-2.94, p=0.015)	1.82 (1.12-2.91, p=0.013)	2.03 (1.22-3.40, p=0.007)
BMI	Normal weight (BMI 18.5 to 24.9)	2386 (97.0)	75 (3.0)	-	-	-	-
	Underweight (BMI < 18.5)	250 (87.7)	35 (12.3)	4.45 (2.89-6.74, p<0.001)	2.33 (1.38-3.87, p=0.001)	2.51 (1.52-4.07, p<0.001)	2.51 (1.49-4.23, p=0.001)
	Overweight (BMI 25 to 30)	2015 (98.0)	42 (2.0)	0.66 (0.45-0.97, p=0.035)	0.78 (0.50-1.20, p=0.261)	0.79 (0.51-1.20, p=0.268)	0.81 (0.52-1.27, p=0.360)
	Obese (BMI >30)	977 (97.5)	25 (2.5)	0.81 (0.50-1.27, p=0.379)	0.96 (0.54-1.64, p=0.873)	0.92 (0.52-1.54, p=0.750)	0.98 (0.56-1.72, p=0.956)
	(Missing)	317 (92.2)	27 (7.8)	2.71 (1.69-4.22, p<0.001)	1.88 (0.94-3.62, p=0.065)	1.49 (0.78-2.70, p=0.208)	1.51 (0.79-2.90, p=0.215)
>10% weight loss	No	3660 (98.0)	76 (2.0)	-	-	-	-
	Yes	1555 (94.2)	96 (5.8)	2.97 (2.19-4.05, p<0.001)	1.23 (0.84-1.82, p=0.289)	-	-
	(Missing)	730 (95.8)	32 (4.2)	2.11 (1.37-3.18, p<0.001)	0.85 (0.45-1.52, p=0.591)	-	-
ECOG performance status	0	2959 (98.9)	33 (1.1)	-	-	-	-
	1	1690 (97.3)	47 (2.7)	2.49 (1.60-3.94, p<0.001)	1.67 (1.02-2.76, p=0.044)	1.70 (1.05-2.80, p=0.032)	1.64 (0.99-2.71, p=0.053)
	2	740 (93.8)	49 (6.2)	5.94 (3.81-9.37, p<0.001)	2.92 (1.75-4.94, p<0.001)	2.98 (1.81-4.98, p<0.001)	2.95 (1.75-4.98, p<0.001)
	3/4	299 (81.5)	68 (18.5)	20.39 (13.34-31.77, p<0.001)	6.71 (3.99-11.46, p<0.001)	7.07 (4.27-11.88, p<0.001)	6.98 (4.08-11.95, p<0.001)
Smoking	No	4638 (96.7)	157 (3.3)	-	-	-	-
	Yes	746 (97.4)	20 (2.6)	0.79 (0.48-1.24, p=0.333)	0.86 (0.48-1.47, p=0.601)	-	-
	(Missing)	561 (95.4)	27 (4.6)	1.42 (0.92-2.12, p=0.099)	0.90 (0.48-1.58, p=0.717)	-	-
Diabetes	No	4696 (97.0)	144 (3.0)	-	-	-	-
	Yes	1108 (95.6)	51 (4.4)	1.50 (1.07-2.06, p=0.015)	1.18 (0.79-1.74, p=0.405)	-	-
Mode of diagnosis	Symptomatic	4607 (96.2)	181 (3.8)	-	-	-	-
	Screening	877 (99.0)	9 (1.0)	0.26 (0.12-0.48, p<0.001)	1.00 (0.43-2.04, p=0.992)	-	-
	Detected incidentally	396 (96.8)	13 (3.2)	0.84 (0.45-1.42, p=0.538)	1.04 (0.47-2.07, p=0.914)	-	-
Urgency	Elective	5199 (97.7)	121 (2.3)	-	-	-	-
	Emergency	746 (90.0)	83 (10.0)	4.78 (3.57-6.38, p<0.001)	1.60 (1.00-2.57, p=0.049)	1.63 (1.03-2.58, p=0.038)	1.70 (1.05-2.75, p=0.032)
Treatment intent	Palliative	606 (87.8)	84 (12.2)	-	-	-	-

	Curative	5339 (97.8)	120 (2.2)	0.16 (0.12-0.22, p<0.001)	0.33 (0.22-0.52, p<0.001)	0.35 (0.23-0.54, p<0.001)	0.34 (0.21-0.53, p<0.001)
Approach	Open	3144 (94.9)	169 (5.1)	-	-	-	-
	Minimally invasive	2774 (98.8)	34 (1.2)	0.23 (0.15-0.33, p<0.001)	0.62 (0.40-0.95, p=0.032)	0.60 (0.38-0.91, p=0.019)	0.65 (0.41-1.02, p=0.063)
Operative site	Right-side	2121 (96.2)	84 (3.8)	-	-	-	-
	Left-side	1651 (95.7)	75 (4.3)	1.15 (0.83-1.58, p=0.398)	0.91 (0.62-1.32, p=0.610)	0.88 (0.60-1.27, p=0.483)	0.84 (0.57-1.24, p=0.378)
	High/mid rectum	1297 (97.7)	31 (2.3)	0.60 (0.39-0.91, p=0.018)	0.59 (0.35-0.97, p=0.042)	0.67 (0.41-1.08, p=0.107)	0.66 (0.40-1.09, p=0.105)
	Low rectum	818 (98.8)	10 (1.2)	0.31 (0.15-0.57, p<0.001)	0.43 (0.20-0.85, p=0.025)	0.42 (0.19-0.83, p=0.020)	0.42 (0.20-0.89, p=0.024)
Pre-op obstruction	No	4718 (97.9)	102 (2.1)	-	-	-	-
	Yes	1038 (91.5)	96 (8.5)	4.28 (3.21-5.70, p<0.001)	1.16 (0.73-1.82, p=0.533)	1.17 (0.75-1.82, p=0.488)	1.14 (0.72-1.82, p=0.576)
Pre-op perforation	No	5551 (97.1)	165 (2.9)	-	-	-	-
	Yes	303 (90.2)	33 (9.8)	3.66 (2.44-5.35, p<0.001)	1.63 (0.98-2.65, p=0.051)	1.66 (1.02-2.66, p=0.038)	1.75 (1.05-2.92, p=0.031)
Stage	0	0 (NaN)	0 (NaN)	-	-	-	-
	I	1744 (97.6)	43 (2.4)	-	-	-	-
	II	1330 (96.9)	43 (3.1)	1.31 (0.85-2.02, p=0.215)	0.87 (0.51-1.47, p=0.593)	0.91 (0.55-1.51, p=0.704)	0.97 (0.57-1.63, p=0.896)
	III	2051 (97.1)	62 (2.9)	1.23 (0.83-1.83, p=0.311)	0.98 (0.60-1.61, p=0.935)	0.99 (0.62-1.61, p=0.978)	0.97 (0.59-1.59, p=0.900)
	IV	780 (93.4)	55 (6.6)	2.86 (1.91-4.32, p<0.001)	0.83 (0.46-1.50, p=0.540)	0.85 (0.48-1.52, p=0.587)	0.85 (0.47-1.55, p=0.599)

OR, odds ratio; WB, World Bank; ASA, American Society of Anesthesiologists operative risk grade; BMI, Body Mass Index; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.

**Table S7B. Colorectal cancer logistic regression analyses: major complication.**

Dependent: Major complication		No	Yes	OR (univariable)	OR (multivariable)	OR (multivariable reduced)	OR (multilevel)
WB income (tertile)	High	3572 (85.8)	590 (14.2)	-	-	-	-
	Upper middle	982 (88.7)	125 (11.3)	0.77 (0.63-0.94, p=0.013)	0.71 (0.56-0.89, p=0.004)	0.73 (0.58-0.91, p=0.006)	0.70 (0.48-1.02, p=0.061)
	Low/lower middle	738 (80.9)	174 (19.1)	1.43 (1.18-1.72, p<0.001)	1.38 (1.07-1.77, p=0.012)	1.38 (1.08-1.74, p=0.008)	1.25 (0.84-1.86, p=0.276)
Age (years)	Mean (SD)	-0.0 (1.0)	0.1 (1.0)	1.14 (1.06-1.23, p<0.001)	1.15 (1.05-1.27, p=0.003)	1.13 (1.03-1.23, p=0.010)	1.14 (1.04-1.25, p=0.007)
Sex	Male	2920 (84.6)	531 (15.4)	-	-	-	-
	Female	2365 (86.9)	357 (13.1)	0.83 (0.72-0.96, p=0.012)	0.80 (0.68-0.94, p=0.008)	0.78 (0.67-0.92, p=0.003)	0.78 (0.67-0.92, p=0.003)
ASA (>3)	No	5034 (86.5)	785 (13.5)	-	-	-	-
	Yes	258 (71.3)	104 (28.7)	2.58 (2.03-3.28, p<0.001)	2.07 (1.52-2.81, p<0.001)	2.05 (1.52-2.74, p<0.001)	2.22 (1.64-3.01, p<0.001)
BMI	Normal weight (BMI 18.5 to 24.9)	2139 (86.5)	335 (13.5)	-	-	-	-
	Underweight (BMI < 18.5)	220 (75.6)	71 (24.4)	2.06 (1.53-2.74, p<0.001)	1.78 (1.27-2.46, p=0.001)	1.72 (1.24-2.36, p=0.001)	1.67 (1.20-2.32, p=0.002)
	Overweight (BMI 25 to 30)	1796 (87.0)	268 (13.0)	0.95 (0.80-1.13, p=0.582)	0.98 (0.81-1.18, p=0.813)	0.98 (0.81-1.18, p=0.838)	0.98 (0.81-1.19, p=0.870)
	Obese (BMI >30)	850 (84.7)	154 (15.3)	1.16 (0.94-1.42, p=0.167)	1.16 (0.91-1.47, p=0.222)	1.18 (0.94-1.48, p=0.152)	1.19 (0.95-1.51, p=0.136)
	(Missing)	287 (82.5)	61 (17.5)	1.36 (1.00-1.82, p=0.046)	1.04 (0.69-1.54, p=0.847)	0.93 (0.63-1.34, p=0.696)	0.92 (0.62-1.36, p=0.664)
>10% weight loss	No	3251 (86.7)	497 (13.3)	-	-	-	-
	Yes	1379 (83.1)	281 (16.9)	1.33 (1.14-1.56, p<0.001)	1.02 (0.84-1.24, p=0.835)	-	-
	(Missing)	662 (85.6)	111 (14.4)	1.10 (0.87-1.36, p=0.415)	0.83 (0.62-1.11, p=0.214)	-	-
ECOG performance status	0	2672 (89.0)	331 (11.0)	-	-	-	-
	1	1504 (86.0)	244 (14.0)	1.31 (1.10-1.56, p=0.003)	1.19 (0.98-1.44, p=0.079)	1.19 (0.99-1.44, p=0.069)	1.19 (0.98-1.45, p=0.078)
	2	640 (80.5)	155 (19.5)	1.96 (1.58-2.41, p<0.001)	1.55 (1.22-1.97, p<0.001)	1.57 (1.24-1.98, p<0.001)	1.54 (1.21-1.96, p<0.001)
	3/4	248 (67.2)	121 (32.8)	3.94 (3.08-5.03, p<0.001)	2.27 (1.68-3.05, p<0.001)	2.24 (1.67-2.99, p<0.001)	2.16 (1.59-2.91, p<0.001)
Smoking	No	4151 (86.1)	668 (13.9)	-	-	-	-
	Yes	643 (83.6)	126 (16.4)	1.22 (0.99-1.49, p=0.063)	1.26 (0.99-1.59, p=0.053)	-	-
	(Missing)	498 (84.0)	95 (16.0)	1.19 (0.93-1.49, p=0.155)	0.99 (0.73-1.33, p=0.967)	-	-
Diabetes	No	4207 (86.4)	661 (13.6)	-	-	-	-
	Yes	961 (82.6)	202 (17.4)	1.34 (1.12-1.59, p=0.001)	1.21 (0.99-1.46, p=0.060)	1.22 (1.01-1.47, p=0.041)	1.18 (0.98-1.44, p=0.085)
Mode of diagnosis	Symptomatic	4082 (84.9)	728 (15.1)	-	-	-	-
	Screening	806 (90.4)	86 (9.6)	0.60 (0.47-0.75, p<0.001)	0.85 (0.65-1.11, p=0.246)	-	-
Urgency	Detected incidentally	345 (83.7)	67 (16.3)	1.09 (0.82-1.42, p=0.541)	1.16 (0.84-1.58, p=0.363)	-	-
	Elective	4654 (87.1)	688 (12.9)	-	-	-	-
	Emergency	638 (76.0)	201 (24.0)	2.13 (1.78-2.54, p<0.001)	1.59 (1.20-2.10, p=0.001)	1.56 (1.24-1.95, p<0.001)	1.55 (1.23-1.96, p<0.001)
Treatment intent	Palliative	554 (79.0)	147 (21.0)	-	-	-	-
	Curative	4738 (86.5)	742 (13.5)	0.59 (0.49-0.72, p<0.001)	0.91 (0.69-1.20, p=0.482)	0.94 (0.74-1.19, p=0.592)	0.91 (0.71-1.16, p=0.439)
Approach	Open	2768 (83.0)	568 (17.0)	-	-	-	-
	Minimally invasive	2500 (88.7)	317 (11.3)	0.62 (0.53-0.72, p<0.001)	0.84 (0.71-1.00, p=0.053)	0.83 (0.70-0.98, p=0.027)	0.80 (0.67-0.96, p=0.017)
Operative site	Right-side	1932 (86.9)	290 (13.1)	-	-	-	-
	Left-side	1476 (85.0)	260 (15.0)	1.17 (0.98-1.41, p=0.082)	1.13 (0.92-1.38, p=0.238)	1.12 (0.92-1.36, p=0.260)	1.13 (0.92-1.38, p=0.243)
	High/mid rectum	1132 (84.9)	201 (15.1)	1.18 (0.97-1.44, p=0.090)	1.36 (1.09-1.70, p=0.006)	1.38 (1.11-1.71, p=0.003)	1.41 (1.13-1.75, p=0.002)
	Low rectum	703 (84.9)	125 (15.1)	1.18 (0.94-1.48, p=0.143)	1.51 (1.17-1.94, p=0.001)	1.48 (1.15-1.88, p=0.002)	1.53 (1.19-1.96, p=0.001)
Pre-op obstruction	No	4215 (87.1)	625 (12.9)	-	-	-	-

Pre-op perforation	Yes	915 (79.9)	230 (20.1)	1.70 (1.43-2.00, p<0.001)	0.94 (0.72-1.21, p=0.618)	-	-
	No	4974 (86.6)	768 (13.4)	-	-	-	-
	Yes	238 (69.6)	104 (30.4)	2.83 (2.21-3.60, p<0.001)	1.94 (1.45-2.57, p<0.001)	1.98 (1.49-2.61, p<0.001)	1.93 (1.45-2.57, p<0.001)
Stage	0	0 (NaN)	0 (NaN)	-	-	-	-
	I	1579 (88.0)	216 (12.0)	-	-	-	-
	II	1162 (84.3)	216 (15.7)	1.36 (1.11-1.67, p=0.003)	1.14 (0.91-1.44, p=0.252)	-	-
	III	1814 (85.6)	305 (14.4)	1.23 (1.02-1.48, p=0.031)	1.09 (0.87-1.35, p=0.460)	-	-
	IV	700 (82.6)	147 (17.4)	1.54 (1.22-1.93, p<0.001)	1.08 (0.80-1.45, p=0.618)	-	-

OR, odds ratio; WB, World Bank; ASA, American Society of Anesthesiologists operative risk grade; BMI, Body Mass Index; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.



**Table S7C. Colorectal cancer logistic regression analyses: all complications.**

Dependent: Any complication		No	Yes	OR (univariable)	OR (multivariable)	OR (multivariable reduced)	OR (multilevel)
WB income (tertile)	High	2188 (52.5)	1977 (47.5)	-	-	-	-
	Upper middle	660 (59.5)	449 (40.5)	0.75 (0.66-0.86, p<0.001)	0.67 (0.58-0.78, p<0.001)	0.68 (0.58-0.79, p<0.001)	0.84 (0.55-1.28, p=0.419)
	Low/lower middle	405 (44.4)	508 (55.6)	1.39 (1.20-1.60, p<0.001)	1.26 (1.04-1.52, p=0.019)	1.28 (1.07-1.54, p=0.007)	1.28 (0.83-1.98, p=0.265)
Age (years)	Mean (SD)	-0.0 (1.0)	0.0 (1.0)	1.10 (1.04-1.15, p<0.001)	1.12 (1.05-1.19, p=0.001)	1.11 (1.04-1.18, p=0.002)	1.15 (1.07-1.23, p<0.001)
Sex	Male	1773 (51.3)	1681 (48.7)	-	-	-	-
	Female	1474 (54.1)	1251 (45.9)	0.90 (0.81-0.99, p=0.031)	0.87 (0.77-0.97, p=0.014)	0.86 (0.77-0.96, p=0.009)	0.85 (0.75-0.96, p=0.010)
ASA (>3)	No	3094 (53.1)	2731 (46.9)	-	-	-	-
	Yes	159 (43.9)	203 (56.1)	1.45 (1.17-1.79, p=0.001)	1.13 (0.85-1.52, p=0.393)	1.16 (0.88-1.55, p=0.295)	1.33 (0.98-1.81, p=0.066)
BMI	Normal weight (BMI 18.5 to 24.9)	1333 (53.8)	1145 (46.2)	-	-	-	-
	Underweight (BMI < 18.5)	126 (43.3)	165 (56.7)	1.52 (1.19-1.95, p=0.001)	1.24 (0.94-1.64, p=0.126)	1.33 (1.02-1.75, p=0.039)	1.31 (0.97-1.76, p=0.076)
	Overweight (BMI 25 to 30)	1128 (54.6)	937 (45.4)	0.97 (0.86-1.09, p=0.576)	1.04 (0.92-1.19, p=0.519)	1.02 (0.89-1.16, p=0.800)	0.99 (0.86-1.14, p=0.864)
	Obese (BMI >30)	474 (47.2)	531 (52.8)	1.30 (1.13-1.51, p<0.001)	1.38 (1.17-1.64, p<0.001)	1.35 (1.15-1.59, p<0.001)	1.24 (1.03-1.48, p=0.021)
	(Missing)	192 (55.2)	156 (44.8)	0.95 (0.75-1.18, p=0.629)	0.77 (0.57-1.05, p=0.100)	0.74 (0.55-0.99, p=0.047)	0.80 (0.57-1.13, p=0.205)
>10% weight loss	No	2041 (54.4)	1708 (45.6)	-	-	-	-
	Yes	792 (47.7)	870 (52.3)	1.31 (1.17-1.47, p<0.001)	1.14 (0.99-1.31, p=0.078)	-	-
	(Missing)	420 (54.1)	356 (45.9)	1.01 (0.87-1.18, p=0.872)	0.98 (0.80-1.19, p=0.832)	-	-
ECOG performance status	0	1747 (58.2)	1257 (41.8)	-	-	-	-
	1	908 (51.9)	841 (48.1)	1.29 (1.14-1.45, p<0.001)	1.17 (1.03-1.34, p=0.017)	1.21 (1.06-1.37, p=0.004)	1.22 (1.06-1.42, p=0.007)
	2	351 (44.1)	445 (55.9)	1.76 (1.51-2.06, p<0.001)	1.48 (1.24-1.78, p<0.001)	1.54 (1.29-1.83, p<0.001)	1.53 (1.25-1.87, p<0.001)
	3/4	111 (30.0)	259 (70.0)	3.24 (2.57-4.11, p<0.001)	2.22 (1.70-2.93, p<0.001)	2.31 (1.78-3.02, p<0.001)	2.28 (1.70-3.06, p<0.001)
Smoking	No	2546 (52.8)	2278 (47.2)	-	-	-	-
	Yes	381 (49.5)	388 (50.5)	1.14 (0.98-1.33, p=0.096)	1.29 (1.08-1.53, p=0.004)	1.28 (1.08-1.52, p=0.004)	1.36 (1.13-1.64, p=0.001)
	(Missing)	326 (54.9)	268 (45.1)	0.92 (0.77-1.09, p=0.332)	0.83 (0.67-1.03, p=0.092)	0.84 (0.68-1.03, p=0.095)	0.91 (0.72-1.15, p=0.436)
Diabetes	No	2629 (54.0)	2242 (46.0)	-	-	-	-
	Yes	547 (46.9)	619 (53.1)	1.33 (1.17-1.51, p<0.001)	1.19 (1.03-1.38, p=0.019)	1.21 (1.05-1.39, p=0.010)	1.16 (1.00-1.36, p=0.056)
Mode of diagnosis	Symptomatic	2474 (51.4)	2340 (48.6)	-	-	-	-
	Screening	525 (58.8)	368 (41.2)	0.74 (0.64-0.86, p<0.001)	0.95 (0.80-1.13, p=0.585)	-	-
	Detected incidentally	218 (52.9)	194 (47.1)	0.94 (0.77-1.15, p=0.553)	1.00 (0.80-1.26, p=0.974)	-	-
Urgency	Elective	2924 (54.7)	2423 (45.3)	-	-	-	-
	Emergency	329 (39.2)	511 (60.8)	1.87 (1.62-2.18, p<0.001)	1.75 (1.40-2.19, p<0.001)	1.78 (1.44-2.22, p<0.001)	1.71 (1.35-2.18, p<0.001)
Treatment intent	Palliative	323 (46.1)	378 (53.9)	-	-	-	-
	Curative	2930 (53.4)	2556 (46.6)	0.75 (0.64-0.87, p<0.001)	1.10 (0.88-1.38, p=0.398)	-	-
Approach	Open	1554 (46.5)	1785 (53.5)	-	-	-	-
	Minimally invasive	1682 (59.6)	1138 (40.4)	0.59 (0.53-0.65, p<0.001)	0.67 (0.59-0.76, p<0.001)	0.65 (0.58-0.73, p<0.001)	0.56 (0.48-0.64, p<0.001)
Operative site	Right-side	1173 (52.7)	1051 (47.3)	-	-	-	-
	Left-side	967 (55.6)	772 (44.4)	0.89 (0.79-1.01, p=0.073)	0.88 (0.76-1.02, p=0.095)	0.88 (0.76-1.01, p=0.065)	0.89 (0.76-1.04, p=0.140)
	High/mid rectum	696 (52.2)	637 (47.8)	1.02 (0.89-1.17, p=0.759)	1.22 (1.04-1.44, p=0.013)	1.19 (1.02-1.38, p=0.028)	1.31 (1.11-1.54, p=0.002)
	Low rectum	393 (47.4)	436 (52.6)	1.24 (1.06-1.45, p=0.009)	1.47 (1.20-1.80, p<0.001)	1.48 (1.24-1.77, p<0.001)	1.66 (1.36-2.01, p<0.001)
Anastomosis	Not performed	661 (46.6)	757 (53.4)	-	-	-	-
	Handsewn	569 (48.4)	607 (51.6)	0.93 (0.80-1.09, p=0.369)	1.12 (0.93-1.36, p=0.237)	-	-

	Stapled	1946 (56.5)	1497 (43.5)	0.67 (0.59-0.76, p<0.001)	0.93 (0.79-1.10, p=0.414)	-	-
Pre-op obstruction	No	2609 (53.9)	2235 (46.1)	-	-	-	-
	Yes	542 (47.3)	604 (52.7)	1.30 (1.14-1.48, p<0.001)	0.85 (0.70-1.02, p=0.088)	0.82 (0.68-0.99, p=0.041)	0.93 (0.75-1.14, p=0.480)
Pre-op perforation	No	3082 (53.6)	2666 (46.4)	-	-	-	-
	Yes	121 (35.4)	221 (64.6)	2.11 (1.69-2.66, p<0.001)	1.73 (1.33-2.26, p<0.001)	1.67 (1.29-2.17, p<0.001)	1.65 (1.24-2.19, p=0.001)
Stage	0	0 (NaN)	0 (NaN)	-	-	-	-
	I	979 (54.5)	818 (45.5)	-	-	-	-
	II	726 (52.6)	653 (47.4)	1.08 (0.94-1.24, p=0.305)	0.93 (0.79-1.10, p=0.409)	0.96 (0.82-1.12, p=0.587)	1.06 (0.89-1.27, p=0.504)
	III	1118 (52.7)	1003 (47.3)	1.07 (0.95-1.22, p=0.269)	0.95 (0.82-1.11, p=0.536)	0.97 (0.84-1.12, p=0.684)	1.00 (0.85-1.17, p=0.968)
	IV	407 (48.0)	441 (52.0)	1.30 (1.10-1.53, p=0.002)	1.03 (0.83-1.28, p=0.769)	1.03 (0.85-1.25, p=0.735)	1.04 (0.84-1.28, p=0.709)

OR, odds ratio; WB, World Bank; ASA, American Society of Anesthesiologists operative risk grade; BMI, Body Mass Index; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.

**Table S8A. Gastric cancer logistic regression analyses: mortality.**

Dependent: 30-day mortality		Alive	Dead	OR (univariable)	OR (multivariable)	OR (multivariable reduced)	OR (multilevel)
WB income (tertile)	High	675 (96.2)	27 (3.8)	-	-	-	-
	Upper middle	272 (96.1)	11 (3.9)	1.01 (0.47-2.01, p=0.976)	1.06 (0.40-2.60, p=0.897)	1.12 (0.44-2.66, p=0.807)	1.12 (0.46-2.74, p=0.807)
	Low/lower middle	293 (89.9)	33 (10.1)	2.82 (1.67-4.80, p<0.001)	2.84 (1.21-6.84, p=0.018)	3.72 (1.72-8.28, p=0.001)	3.72 (1.70-8.16, p=0.001)
Age (years)	Mean (SD)	-0.0 (1.0)	0.5 (1.0)	1.74 (1.33-2.30, p<0.001)	2.08 (1.39-3.21, p=0.001)	2.02 (1.39-3.02, p<0.001)	2.02 (1.38-2.98, p<0.001)
Sex	Male	752 (93.8)	50 (6.2)	-	-	-	-
	Female	488 (95.9)	21 (4.1)	0.65 (0.38-1.08, p=0.102)	0.80 (0.38-1.62, p=0.545)	-	-
ASA (>3)	No	1192 (95.7)	54 (4.3)	-	-	-	-
	Yes	48 (73.8)	17 (26.2)	7.82 (4.13-14.28, p<0.001)	2.55 (0.99-6.24, p=0.045)	2.38 (0.94-5.70, p=0.057)	2.38 (0.97-5.83, p=0.057)
BMI	Normal weight (BMI 18.5 to 24.9)	604 (94.5)	35 (5.5)	-	-	-	-
	Underweight (BMI < 18.5)	112 (92.6)	9 (7.4)	1.39 (0.61-2.85, p=0.399)	0.56 (0.19-1.47, p=0.259)	0.49 (0.18-1.23, p=0.148)	0.49 (0.19-1.29, p=0.148)
	Overweight (BMI 25 to 30)	348 (95.6)	16 (4.4)	0.79 (0.42-1.43, p=0.454)	1.17 (0.51-2.54, p=0.705)	1.05 (0.49-2.17, p=0.895)	1.05 (0.50-2.20, p=0.895)
	Obese (BMI >30)	121 (96.0)	5 (4.0)	0.71 (0.24-1.70, p=0.489)	0.83 (0.18-2.79, p=0.782)	0.76 (0.17-2.43, p=0.674)	0.76 (0.21-2.76, p=0.674)
	(Missing)	55 (90.2)	6 (9.8)	1.88 (0.69-4.38, p=0.173)	0.96 (0.18-3.94, p=0.957)	0.77 (0.15-3.07, p=0.728)	0.77 (0.17-3.42, p=0.728)
ECOG performance status	0	595 (98.7)	8 (1.3)	-	-	-	-
	1	395 (95.0)	21 (5.0)	3.95 (1.80-9.58, p=0.001)	4.08 (1.50-13.15, p=0.010)	3.10 (1.22-8.96, p=0.024)	3.10 (1.16-8.25, p=0.024)
	2	150 (87.7)	21 (12.3)	10.41 (4.69-25.45, p<0.001)	8.73 (3.10-28.92, p<0.001)	6.94 (2.71-20.32, p<0.001)	6.94 (2.57-18.74, p<0.001)
	3/4	64 (77.1)	19 (22.9)	22.08 (9.60-55.43, p<0.001)	8.41 (2.45-32.09, p=0.001)	7.08 (2.33-23.37, p=0.001)	7.08 (2.27-22.09, p=0.001)
Smoking	No	927 (95.5)	44 (4.5)	-	-	-	-
	Yes	182 (92.9)	14 (7.1)	1.62 (0.84-2.95, p=0.128)	3.00 (1.35-6.53, p=0.006)	2.70 (1.27-5.55, p=0.008)	2.70 (1.30-5.62, p=0.008)
	(Missing)	131 (91.0)	13 (9.0)	2.09 (1.06-3.88, p=0.025)	2.93 (1.05-7.59, p=0.032)	3.00 (1.16-7.24, p=0.018)	3.00 (1.21-7.43, p=0.018)
Diabetes	No	1032 (95.1)	53 (4.9)	-	-	-	-
	Yes	189 (93.6)	13 (6.4)	1.34 (0.69-2.43, p=0.360)	0.82 (0.35-1.79, p=0.636)	-	-
Mode of diagnosis	Symptomatic	1088 (94.4)	65 (5.6)	-	-	-	-
	Screening	40 (97.6)	1 (2.4)	0.42 (0.02-1.97, p=0.393)	1.64 (0.08-9.90, p=0.654)	1.76 (0.09-9.99, p=0.601)	1.76 (0.21-14.61, p=0.601)
	Detected incidentally	96 (97.0)	3 (3.0)	0.52 (0.13-1.44, p=0.280)	0.69 (0.09-3.02, p=0.663)	0.62 (0.09-2.62, p=0.566)	0.62 (0.12-3.18, p=0.566)
Urgency	Elective	1180 (95.8)	52 (4.2)	-	-	-	-
	Emergency	60 (75.9)	19 (24.1)	7.19 (3.93-12.75, p<0.001)	3.26 (1.33-7.61, p=0.008)	2.63 (1.14-5.81, p=0.019)	2.63 (1.17-5.92, p=0.019)
Treatment intent	Palliative	158 (84.5)	29 (15.5)	-	-	-	-
	Curative	1082 (96.3)	42 (3.7)	0.21 (0.13-0.35, p<0.001)	1.23 (0.48-3.29, p=0.666)	-	-
Approach	Open	926 (94.1)	58 (5.9)	-	-	-	-
	Minimally invasive	311 (96.0)	13 (4.0)	0.67 (0.35-1.20, p=0.197)	1.06 (0.43-2.39, p=0.895)	-	-
Site	Upper third (cardia/fundus)	243 (94.2)	15 (5.8)	-	-	-	-
	Middle third (body)	244 (96.8)	8 (3.2)	0.53 (0.21-1.25, p=0.157)	0.47 (0.15-1.35, p=0.173)	-	-
	Distal third (antrum/pylorus)	533 (93.8)	35 (6.2)	1.06 (0.58-2.04, p=0.846)	0.62 (0.28-1.44, p=0.256)	-	-
	Entire stomach	197 (94.7)	11 (5.3)	0.90 (0.40-2.00, p=0.806)	1.13 (0.40-3.07, p=0.811)	-	-
D2 resection	No	500 (91.7)	45 (8.3)	-	-	-	-
	Yes	683 (96.7)	23 (3.3)	0.37 (0.22-0.62, p<0.001)	0.82 (0.40-1.67, p=0.584)	0.82 (0.43-1.58, p=0.561)	0.82 (0.43-1.58, p=0.561)
Pre-op obstruction	No	1062 (96.4)	40 (3.6)	-	-	-	-

Pre-op perforation	Yes	159 (85.0)	28 (15.0)	4.68 (2.78-7.76, p<0.001)	2.06 (0.93-4.46, p=0.071)	1.81 (0.89-3.61, p=0.093)	1.81 (0.91-3.63, p=0.093)
	No	1190 (95.0)	63 (5.0)	-	-	-	-
Stage	Yes	37 (84.1)	7 (15.9)	3.57 (1.41-7.88, p=0.003)	2.49 (0.75-7.36, p=0.114)	2.41 (0.77-6.75, p=0.110)	2.41 (0.82-7.06, p=0.110)
	0	0 (NaN)	0 (NaN)	-	-	-	-
	I	427 (96.6)	15 (3.4)	-	-	-	-
	II	221 (96.1)	9 (3.9)	1.16 (0.48-2.65, p=0.731)	0.93 (0.29-2.81, p=0.903)	0.83 (0.27-2.37, p=0.731)	0.83 (0.28-2.41, p=0.731)
	III	473 (95.4)	23 (4.6)	1.38 (0.72-2.74, p=0.337)	1.05 (0.43-2.62, p=0.923)	1.11 (0.49-2.60, p=0.806)	1.11 (0.48-2.54, p=0.806)
IV	108 (83.1)	22 (16.9)	5.80 (2.93-11.77, p<0.001)	3.26 (1.06-10.25, p=0.041)	2.60 (1.03-6.77, p=0.046)	2.60 (1.02-6.63, p=0.046)	

OR, odds ratio; WB, World Bank; ASA, American Society of Anesthesiologists operative risk grade; BMI, Body Mass Index; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.

**Table S8B. Gastric cancer logistic regression analyses: major complication.**

Dependent: Major complication		No	Yes	OR (univariable)	OR (multivariable)	OR (multivariable reduced)	OR (multilevel)
WB income (tertile)	High	604 (85.2)	105 (14.8)	-	-	-	-
	Upper middle	258 (90.8)	26 (9.2)	0.58 (0.36-0.90, p=0.018)	0.60 (0.35-1.00, p=0.058)	0.60 (0.36-0.98, p=0.046)	0.55 (0.30-1.02, p=0.057)
	Low/lower middle	267 (81.4)	61 (18.6)	1.31 (0.93-1.85, p=0.123)	1.16 (0.68-1.97, p=0.587)	1.29 (0.80-2.06, p=0.293)	1.25 (0.71-2.22, p=0.436)
Age (years)	Mean (SD)	-0.0 (1.0)	0.3 (0.9)	1.49 (1.27-1.77, p<0.001)	1.49 (1.19-1.88, p=0.001)	1.51 (1.22-1.88, p<0.001)	1.53 (1.21-1.92, p<0.001)
Sex	Male	677 (84.1)	128 (15.9)	-	-	-	-
	Female	452 (87.6)	64 (12.4)	0.75 (0.54-1.03, p=0.079)	0.88 (0.59-1.30, p=0.515)	-	-
ASA (>3)	No	1088 (86.7)	167 (13.3)	-	-	-	-
	Yes	41 (62.1)	25 (37.9)	3.97 (2.33-6.66, p<0.001)	1.85 (0.90-3.74, p=0.090)	2.63 (1.39-4.89, p=0.003)	3.15 (1.57-6.31, p=0.001)
BMI	Normal weight (BMI 18.5 to 24.9)	546 (85.0)	96 (15.0)	-	-	-	-
	Underweight (BMI < 18.5)	105 (84.7)	19 (15.3)	1.03 (0.59-1.72, p=0.916)	0.64 (0.32-1.21, p=0.182)	0.60 (0.31-1.09, p=0.106)	0.61 (0.32-1.18, p=0.141)
	Overweight (BMI 25 to 30)	312 (85.2)	54 (14.8)	0.98 (0.68-1.41, p=0.932)	1.04 (0.67-1.60, p=0.852)	1.10 (0.73-1.65, p=0.647)	1.07 (0.70-1.65, p=0.746)
	Obese (BMI >30)	113 (88.3)	15 (11.7)	0.75 (0.41-1.31, p=0.343)	0.77 (0.37-1.49, p=0.458)	0.80 (0.41-1.48, p=0.494)	0.74 (0.38-1.47, p=0.394)
	(Missing)	53 (86.9)	8 (13.1)	0.86 (0.37-1.77, p=0.699)	0.54 (0.16-1.51, p=0.277)	0.77 (0.26-1.94, p=0.600)	0.77 (0.27-2.18, p=0.616)
ECOG performance status	0	557 (92.4)	46 (7.6)	-	-	-	-
	1	346 (82.4)	74 (17.6)	2.59 (1.76-3.85, p<0.001)	2.34 (1.49-3.70, p<0.001)	2.31 (1.51-3.57, p<0.001)	2.40 (1.52-3.78, p<0.001)
	2	139 (79.9)	35 (20.1)	3.05 (1.88-4.91, p<0.001)	2.24 (1.26-3.93, p=0.005)	2.16 (1.26-3.67, p=0.005)	2.10 (1.18-3.72, p=0.011)
	3/4	55 (64.0)	31 (36.0)	6.82 (3.99- 11.62, p<0.001)	3.73 (1.76-7.82, p<0.001)	4.02 (2.10-7.63, p<0.001)	3.97 (1.97-8.01, p<0.001)
Smoking	No	842 (86.1)	136 (13.9)	-	-	-	-
	Yes	163 (82.3)	35 (17.7)	1.33 (0.87-1.98, p=0.171)	1.85 (1.13-2.98, p=0.012)	1.78 (1.12-2.79, p=0.013)	1.68 (1.04-2.72, p=0.036)
	(Missing)	124 (85.5)	21 (14.5)	1.05 (0.62-1.69, p=0.852)	1.08 (0.53-2.05, p=0.830)	0.81 (0.42-1.49, p=0.522)	0.80 (0.41-1.56, p=0.507)
Diabetes	No	944 (86.3)	150 (13.7)	-	-	-	-
	Yes	168 (82.8)	35 (17.2)	1.31 (0.87-1.94, p=0.188)	0.97 (0.59-1.57, p=0.911)	-	-
Mode of diagnosis	Symptomatic	991 (85.3)	171 (14.7)	-	-	-	-
	Screening	34 (82.9)	7 (17.1)	1.19 (0.48-2.58, p=0.676)	1.45 (0.46-3.77, p=0.484)	1.53 (0.53-3.79, p=0.386)	1.63 (0.58-4.57, p=0.351)
	Detected incidentally	90 (90.0)	10 (10.0)	0.64 (0.31-1.20, p=0.200)	0.60 (0.24-1.33, p=0.236)	0.48 (0.19-1.04, p=0.081)	0.51 (0.21-1.22, p=0.130)
Urgency	Elective	1081 (87.2)	159 (12.8)	-	-	-	-
	Emergency	48 (59.3)	33 (40.7)	4.67 (2.89-7.48, p<0.001)	3.62 (1.93-6.74, p<0.001)	3.70 (2.07-6.56, p<0.001)	4.06 (2.17-7.60, p<0.001)
Treatment intent	Palliative	145 (76.3)	45 (23.7)	-	-	-	-
	Curative	984 (87.0)	147 (13.0)	0.48 (0.33-0.71, p<0.001)	1.16 (0.62-2.23, p=0.643)	0.95 (0.57-1.63, p=0.857)	0.99 (0.56-1.74, p=0.961)
Approach	Open	843 (85.1)	148 (14.9)	-	-	-	-
	Minimally invasive	284 (86.9)	43 (13.1)	0.86 (0.59-1.23, p=0.427)	1.03 (0.65-1.62, p=0.890)	-	-
Site	Upper third (cardia/fundus)	220 (84.6)	40 (15.4)	-	-	-	-
	Middle third (body)	214 (84.6)	39 (15.4)	1.00 (0.62-1.62, p=0.992)	1.09 (0.62-1.92, p=0.758)	0.99 (0.58-1.69, p=0.966)	0.96 (0.55-1.70, p=0.899)
	Distal third (antrum/pylorus)	497 (86.9)	75 (13.1)	0.83 (0.55-1.27, p=0.379)	0.59 (0.35-0.99, p=0.045)	0.64 (0.40-1.02, p=0.059)	0.62 (0.38-1.02, p=0.060)
	Entire stomach	174 (82.9)	36 (17.1)	1.14 (0.69-1.86, p=0.607)	1.45 (0.81-2.59, p=0.209)	1.39 (0.81-2.38, p=0.233)	1.42 (0.80-2.54, p=0.235)
Anastomosis	Not performed	158 (88.8)	20 (11.2)	-	-	-	-
	Handsewn	337 (85.1)	59 (14.9)	1.38 (0.82-2.43, p=0.240)	1.76 (0.88-3.66, p=0.119)	-	-
	Stapled	607 (85.0)	107 (15.0)	1.39 (0.85-2.37, p=0.202)	1.88 (0.99-3.74, p=0.061)	-	-
D2 resection	No	459 (83.3)	92 (16.7)	-	-	-	-

	Yes	614 (86.8)	93 (13.2)	0.76 (0.55-1.03, p=0.079)	1.06 (0.70-1.62, p=0.776)	-	-
Pre-op obstruction	No	973 (87.7)	136 (12.3)	-	-	-	-
	Yes	139 (73.2)	51 (26.8)	2.62 (1.81-3.77, p<0.001)	1.81 (1.07-3.04, p=0.025)	-	-
Pre-op perforation	No	1084 (86.0)	177 (14.0)	-	-	-	-
	Yes	34 (73.9)	12 (26.1)	2.16 (1.06-4.14, p=0.026)	1.50 (0.63-3.42, p=0.341)	-	-
Stage	0	0 (NaN)	0 (NaN)	-	-	-	-
	I	392 (87.9)	54 (12.1)	-	-	-	-
	II	203 (87.9)	28 (12.1)	1.00 (0.61-1.62, p=0.996)	0.79 (0.43-1.43, p=0.445)	0.83 (0.47-1.44, p=0.511)	0.90 (0.50-1.63, p=0.723)
	III	423 (84.6)	77 (15.4)	1.32 (0.91-1.93, p=0.144)	1.03 (0.64-1.65, p=0.916)	1.15 (0.75-1.78, p=0.529)	1.30 (0.81-2.08, p=0.279)
	IV	100 (76.3)	31 (23.7)	2.25 (1.36-3.67, p=0.001)	1.52 (0.73-3.12, p=0.262)	1.53 (0.78-2.95, p=0.208)	1.75 (0.86-3.57, p=0.126)

OR, odds ratio; WB, World Bank; ASA, American Society of Anesthesiologists operative risk grade; BMI, Body Mass Index; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.

**Table S8C. Gastric cancer logistic regression analyses: all complications.**

Dependent: Any complication		No	Yes	OR (univariable)	OR (multivariable)	OR (multivariable reduced)	OR (multilevel)
WB income (tertile)	High	398 (56.1)	311 (43.9)	-	-	-	-
	Upper middle	142 (50.0)	142 (50.0)	1.28 (0.97-1.69, p=0.080)	1.33 (0.96-1.84, p=0.089)	1.34 (0.99-1.81, p=0.059)	1.71 (0.85-3.43, p=0.130)
	Low/lower middle	169 (51.5)	159 (48.5)	1.20 (0.93-1.57, p=0.166)	1.18 (0.81-1.71, p=0.388)	1.21 (0.86-1.69, p=0.281)	1.05 (0.57-1.92, p=0.881)
Age (years)	Mean (SD)	-0.1 (1.0)	0.1 (1.0)	1.16 (1.04-1.30, p=0.008)	1.11 (0.97-1.28, p=0.138)	1.10 (0.96-1.25, p=0.178)	1.13 (0.96-1.33, p=0.129)
Sex	Male	421 (52.3)	384 (47.7)	-	-	-	-
	Female	288 (55.8)	228 (44.2)	0.87 (0.69-1.08, p=0.211)	0.92 (0.71-1.19, p=0.505)	-	-
ASA (>3)	No	681 (54.3)	574 (45.7)	-	-	-	-
	Yes	28 (42.4)	38 (57.6)	1.61 (0.98-2.68, p=0.062)	1.36 (0.72-2.61, p=0.350)	1.36 (0.76-2.46, p=0.308)	1.65 (0.83-3.27, p=0.154)
BMI	Normal weight (BMI 18.5 to 24.9)	338 (52.6)	304 (47.4)	-	-	-	-
	Underweight (BMI < 18.5)	67 (54.0)	57 (46.0)	0.95 (0.64-1.39, p=0.777)	0.86 (0.55-1.35, p=0.522)	0.79 (0.52-1.21, p=0.288)	0.93 (0.57-1.52, p=0.774)
	Overweight (BMI 25 to 30)	193 (52.7)	173 (47.3)	1.00 (0.77-1.29, p=0.979)	0.92 (0.68-1.23, p=0.563)	0.97 (0.74-1.29, p=0.854)	1.01 (0.73-1.40, p=0.943)
	Obese (BMI >30)	73 (57.0)	55 (43.0)	0.84 (0.57-1.23, p=0.364)	0.73 (0.46-1.14, p=0.172)	0.75 (0.49-1.13, p=0.173)	0.78 (0.48-1.27, p=0.312)
	(Missing)	38 (62.3)	23 (37.7)	0.67 (0.39-1.15, p=0.151)	0.45 (0.20-0.95, p=0.041)	0.44 (0.21-0.87, p=0.023)	0.39 (0.17-0.88, p=0.024)
>10% weight loss	No	342 (54.7)	283 (45.3)	-	-	-	-
	Yes	310 (52.7)	278 (47.3)	1.08 (0.86-1.36, p=0.485)	0.85 (0.63-1.13, p=0.262)	-	-
	(Missing)	57 (52.8)	51 (47.2)	1.08 (0.72-1.63, p=0.708)	0.99 (0.59-1.66, p=0.963)	-	-
ECOG performance status	0	362 (60.0)	241 (40.0)	-	-	-	-
	1	217 (51.7)	203 (48.3)	1.41 (1.09-1.81, p=0.008)	1.40 (1.05-1.88, p=0.022)	1.36 (1.03-1.79, p=0.029)	1.57 (1.13-2.20, p=0.008)
	2	86 (49.4)	88 (50.6)	1.54 (1.10-2.16, p=0.013)	1.47 (0.98-2.20, p=0.064)	1.37 (0.93-2.01, p=0.108)	1.51 (0.96-2.38, p=0.077)
	3/4	30 (34.9)	56 (65.1)	2.80 (1.76-4.54, p<0.001)	2.24 (1.21-4.21, p=0.011)	2.64 (1.50-4.75, p=0.001)	3.66 (1.87-7.17, p<0.001)
Smoking	No	517 (52.9)	461 (47.1)	-	-	-	-
	Yes	112 (56.6)	86 (43.4)	0.86 (0.63-1.17, p=0.341)	1.07 (0.75-1.51, p=0.705)	-	-
	(Missing)	80 (55.2)	65 (44.8)	0.91 (0.64-1.29, p=0.603)	0.87 (0.55-1.39, p=0.574)	-	-
Diabetes	No	612 (55.9)	482 (44.1)	-	-	-	-
	Yes	86 (42.4)	117 (57.6)	1.73 (1.28-2.34, p<0.001)	1.69 (1.19-2.41, p=0.003)	1.76 (1.26-2.47, p=0.001)	1.61 (1.09-2.37, p=0.017)
Mode of diagnosis	Symptomatic	623 (53.6)	539 (46.4)	-	-	-	-
	Screening	21 (51.2)	20 (48.8)	1.10 (0.59-2.06, p=0.763)	1.31 (0.64-2.67, p=0.454)	-	-
	Detected incidentally	56 (56.0)	44 (44.0)	0.91 (0.60-1.37, p=0.646)	1.07 (0.66-1.74, p=0.776)	-	-
Urgency	Elective	679 (54.8)	561 (45.2)	-	-	-	-
	Emergency	30 (37.0)	51 (63.0)	2.06 (1.30-3.31, p=0.002)	2.06 (1.17-3.67, p=0.013)	1.95 (1.17-3.31, p=0.012)	2.27 (1.23-4.19, p=0.009)
Treatment intent	Palliative	97 (51.1)	93 (48.9)	-	-	-	-
	Curative	612 (54.1)	519 (45.9)	0.88 (0.65-1.20, p=0.434)	0.87 (0.55-1.40, p=0.574)	-	-
Approach	Open	515 (52.0)	476 (48.0)	-	-	-	-
	Minimally invasive	192 (58.7)	135 (41.3)	0.76 (0.59-0.98, p=0.034)	0.84 (0.62-1.14, p=0.261)	-	-
Site	Upper third (cardia/fundus)	134 (51.5)	126 (48.5)	-	-	-	-
	Middle third (body)	144 (56.9)	109 (43.1)	0.81 (0.57-1.14, p=0.222)	0.90 (0.61-1.33, p=0.590)	0.89 (0.61-1.29, p=0.533)	0.81 (0.52-1.25, p=0.342)
	Distal third (antrum/pylorus)	318 (55.6)	254 (44.4)	0.85 (0.63-1.14, p=0.277)	0.83 (0.59-1.16, p=0.272)	0.77 (0.56-1.07, p=0.124)	0.63 (0.43-0.93, p=0.019)

	Entire stomach	99 (47.1)	111 (52.9)	1.19 (0.83-1.72, p=0.344)	1.26 (0.84-1.90, p=0.270)	1.21 (0.82-1.79, p=0.348)	0.99 (0.62-1.59, p=0.970)
Anastomosis	Not performed	113 (63.5)	65 (36.5)	-	-	-	-
	Handsewn	210 (53.0)	186 (47.0)	1.54 (1.07-2.22, p=0.020)	1.92 (1.21-3.07, p=0.006)	1.79 (1.19-2.72, p=0.006)	2.37 (1.45-3.89, p=0.001)
	Stapled	374 (52.4)	340 (47.6)	1.58 (1.13-2.23, p=0.008)	2.00 (1.31-3.10, p=0.002)	1.79 (1.23-2.62, p=0.002)	2.16 (1.38-3.38, p=0.001)
D2 resection	No	297 (53.9)	254 (46.1)	-	-	-	-
	Yes	380 (53.7)	327 (46.3)	1.01 (0.80-1.26, p=0.957)	0.96 (0.72-1.27, p=0.756)	-	-
Pre-op obstruction	No	595 (53.7)	514 (46.3)	-	-	-	-
	Yes	100 (52.6)	90 (47.4)	1.04 (0.76-1.42, p=0.794)	0.78 (0.52-1.18, p=0.240)	-	-
Pre-op perforation	No	678 (53.8)	583 (46.2)	-	-	-	-
	Yes	22 (47.8)	24 (52.2)	1.27 (0.70-2.30, p=0.428)	0.92 (0.44-1.91, p=0.824)	-	-
Stage	0	0 (NaN)	0 (NaN)	-	-	-	-
	I	248 (55.6)	198 (44.4)	-	-	-	-
	II	125 (54.1)	106 (45.9)	1.06 (0.77-1.46, p=0.711)	0.91 (0.62-1.32, p=0.610)	-	-
	III	265 (53.0)	235 (47.0)	1.11 (0.86-1.44, p=0.422)	0.88 (0.64-1.21, p=0.439)	-	-
	IV	65 (49.6)	66 (50.4)	1.27 (0.86-1.88, p=0.227)	1.03 (0.60-1.75, p=0.927)	-	-

OR, odds ratio; WB, World Bank; ASA, American Society of Anesthesiologists operative risk grade; BMI, Body Mass Index; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.



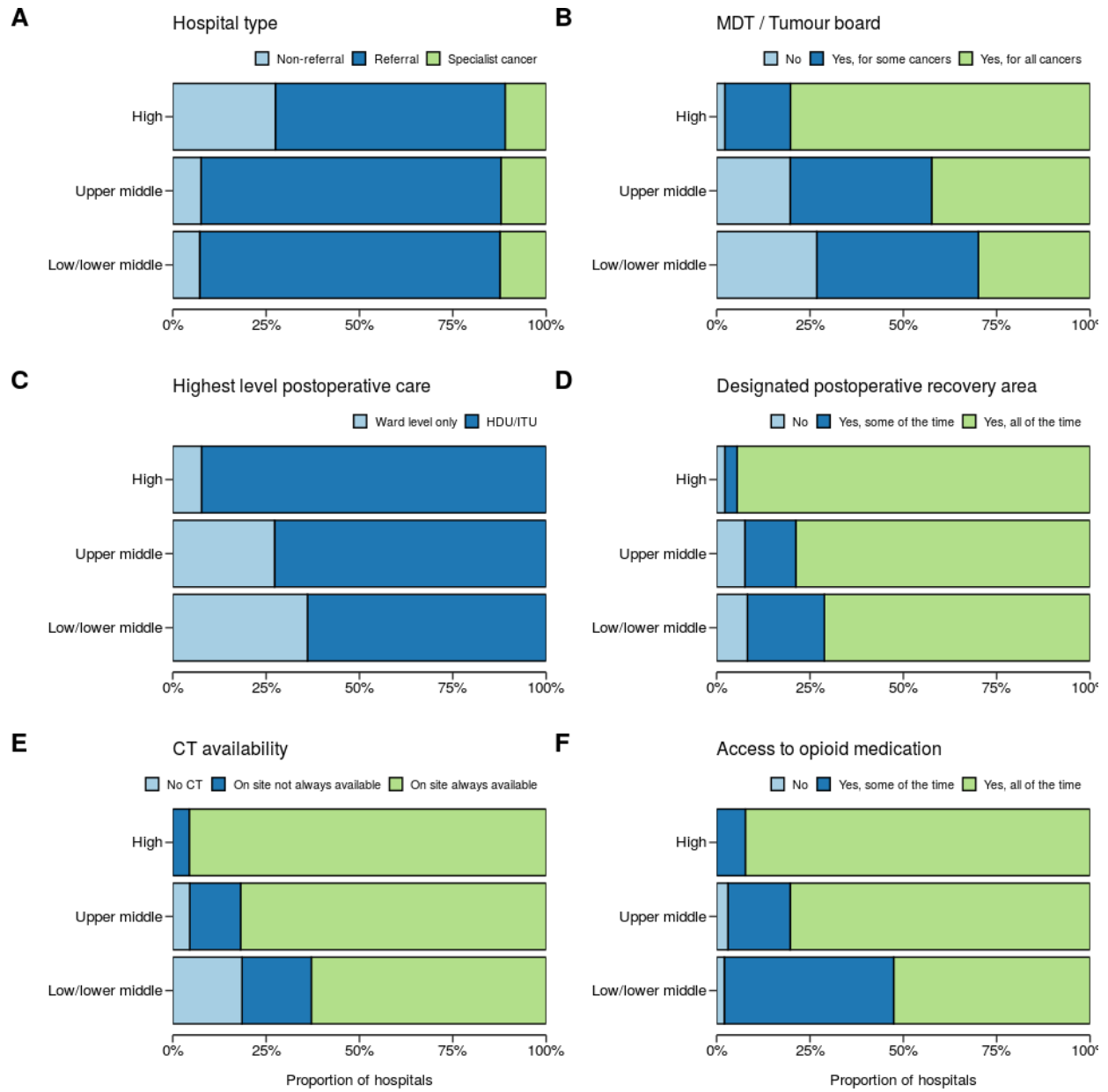
**Table S9. Complications in patients who died.**

			High	Upper middle	Low/lower middle	
Breast	Minor complication (CD1)	Yes	1 (25.0)	0 (0.0)	1 (16.7)	
	Minor complication (CD2)	Yes	1 (25.0)	0 (0.0)	2 (33.3)	
	Reintervention (CD3)	No	2 (50.0)	2 (100.0)	6 (100.0)	
		Yes, NOT under general anaesthetic	1 (25.0)	0 (0.0)	0 (0.0)	
		Yes under general anaesthetic	1 (25.0)	0 (0.0)	0 (0.0)	
	Life-threatening complication (CD4)	No	2 (50.0)	0 (0.0)	2 (33.3)	
		Yes, single organ failure	1 (25.0)	0 (0.0)	2 (33.3)	
		Yes, multi organ failure	1 (25.0)	2 (100.0)	2 (33.3)	
	Any complication	Yes	4 (100.0)	2 (100.0)	10 (100.0)	
	Readmission	Yes	1 (25.0)	0 (0.0)	2 (40.0)	
	Surgical site infection	No	4 (100.0)	2 (100.0)	3 (50.0)	
		Yes, no treatment/wound opened only (CD 1)	0 (0.0)	0 (0.0)	1 (16.7)	
		Yes, antibiotics only (CD 2)	0 (0.0)	0 (0.0)	1 (16.7)	
		Yes, return to operating theatre (CD 3)	0 (0.0)	0 (0.0)	0 (0.0)	
		Yes, requiring critical care admission (CD 4)	0 (0.0)	0 (0.0)	1 (16.7)	
		Yes, resulting in death (CD 5)	0 (0.0)	0 (0.0)	0 (0.0)	
		Post-op bleed	No	4 (100.0)	2 (100.0)	6 (85.7)
			Yes, no intervention required (CD 1)	0 (0.0)	0 (0.0)	0 (0.0)
			Yes, transfusion only (CD 2)	0 (0.0)	0 (0.0)	0 (0.0)
			Yes, surgical/radiological intervention required (CD 3)	0 (0.0)	0 (0.0)	0 (0.0)
	Seroma	Yes, critical care admission &/or intervention (CD 4)	0 (0.0)	0 (0.0)	0 (0.0)	
		Yes, resulting in death (CD 5)	0 (0.0)	0 (0.0)	1 (14.3)	
		No	4 (100.0)	2 (100.0)	4 (66.7)	
Yes, no intervention/aspiration only (CD 1)		0 (0.0)	0 (0.0)	2 (33.3)		
Gastric	Yes, antibiotic treatment only (CD 2)	0 (0.0)	0 (0.0)	0 (0.0)		
	Yes, intervention required (CD 3)	0 (0.0)	0 (0.0)	0 (0.0)		
	Yes, critical care admission &/or intervention (CD 4)	0 (0.0)	0 (0.0)	0 (0.0)		
	Yes, resulting in death (CD 5)	0 (0.0)	0 (0.0)	0 (0.0)		
	Minor complication (CD1)	Yes	10 (37.0)	2 (18.2)	9 (32.1)	
Minor complication (CD2)	Yes	14 (51.9)	3 (27.3)	13 (44.8)		
Reintervention (CD3)	No	17 (63.0)	6 (54.5)	24 (77.4)		
	Yes, NOT under general anaesthetic	0 (0.0)	2 (18.2)	0 (0.0)		
	Yes, under general anaesthetic	10 (37.0)	3 (27.3)	7 (22.6)		
Life-threatening complication (CD4)	No	9 (33.3)	2 (18.2)	15 (48.4)		
	Yes, single organ failure	3 (11.1)	3 (27.3)	3 (9.7)		
	Yes, multi organ failure	15 (55.6)	6 (54.5)	13 (41.9)		
Any complication	Yes	27 (100.0)	11 (100.0)	33 (100.0)		
Readmission	Yes	2 (7.4)	2 (18.2)	6 (20.0)		
Surgical site infection	No	18 (72.0)	9 (81.8)	22 (78.6)		
	Yes, no treatment/wound opened only (CD 1)	1 (4.0)	0 (0.0)	1 (3.6)		
	Yes, antibiotics only (CD 2)	2 (8.0)	1 (9.1)	4 (14.3)		
	Yes, return to operating theatre (CD 3)	1 (4.0)	0 (0.0)	0 (0.0)		
	Yes, requiring critical care admission (CD 4)	1 (4.0)	0 (0.0)	1 (3.6)		
	Yes, resulting in death (CD 5)	2 (8.0)	1 (9.1)	0 (0.0)		
	Abscess (OSI)	No	18 (69.2)	10 (90.9)	24 (96.0)	
		Yes, no intervention (CD 1)	0 (0.0)	0 (0.0)	0 (0.0)	
		Yes, antibiotics only (CD 2)	1 (3.8)	0 (0.0)	0 (0.0)	
		Yes, surgical/radiological drainage (CD 3)	2 (7.7)	1 (9.1)	1 (4.0)	
Anastomotic leak	Yes, critical care admission (CD 4)	2 (7.7)	0 (0.0)	0 (0.0)		
	Yes, resulting in death (CD 5)	3 (11.5)	0 (0.0)	0 (0.0)		
	No	20 (74.1)	7 (63.6)	23 (82.1)		
	Yes, no intervention required (CD 1)	0 (0.0)	0 (0.0)	0 (0.0)		
	Yes, drug treatment only (CD 2)	0 (0.0)	0 (0.0)	0 (0.0)		
Post-op bleed	Yes, intervention required (CD 3)	1 (3.7)	1 (9.1)	3 (10.7)		
	Yes, critical care admission &/or intervention (CD 4)	3 (11.1)	1 (9.1)	2 (7.1)		
	Yes, resulting in death (CD 5)	3 (11.1)	2 (18.2)	0 (0.0)		
	No	23 (85.2)	8 (80.0)	23 (82.1)		

		Yes, no intervention required (CD 1)	0 (0.0)	0 (0.0)	0 (0.0)
		Yes, transfusion only (CD 2)	0 (0.0)	0 (0.0)	0 (0.0)
		Yes, surgical/radiological intervention required (CD 3)	0 (0.0)	0 (0.0)	1 (3.6)
		Yes, critical care admission &/or intervention (CD 4)	1 (3.7)	1 (10.0)	2 (7.1)
		Yes, resulting in death (CD 5)	3 (11.1)	1 (10.0)	2 (7.1)
Colorectal	Minor complication (CD1)	Yes	30 (32.3)	10 (22.7)	26 (47.3)
	Minor complication (CD2)	Yes	36 (39.1)	13 (29.5)	32 (57.1)
	Reintervention (CD3)	No	63 (67.0)	33 (73.3)	35 (61.4)
		Yes, NOT under general anaesthetic	4 (4.3)	0 (0.0)	5 (8.8)
		Yes, under general anaesthetic	27 (28.7)	12 (26.7)	17 (29.8)
	Life-threatening complication (CD4)	No	32 (34.4)	16 (34.8)	12 (20.3)
		Yes, single organ failure	13 (14.0)	5 (10.9)	11 (18.6)
		Yes, multi organ failure	48 (51.6)	25 (54.3)	36 (61.0)
	Any complication	Yes	94 (100.0)	47 (100.0)	63 (100.0)
	Readmission	Yes	9 (9.7)	9 (20.0)	16 (27.6)
	Surgical site infection	No	70 (77.8)	26 (60.5)	27 (50.9)
		Yes, no treatment/wound opened only (CD 1)	2 (2.2)	4 (9.3)	4 (7.5)
		Yes, antibiotics only (CD 2)	7 (7.8)	3 (7.0)	8 (15.1)
		Yes, return to operating theatre (CD 3)	6 (6.7)	1 (2.3)	5 (9.4)
		Yes, requiring critical care admission (CD 4)	2 (2.2)	5 (11.6)	3 (5.7)
		Yes, resulting in death (CD 5)	3 (3.3)	4 (9.3)	6 (11.3)
	Abscess (OSI)	No	72 (80.0)	31 (70.5)	34 (70.8)
		Yes, no intervention (CD 1)	0 (0.0)	0 (0.0)	0 (0.0)
		Yes, antibiotics only (CD 2)	3 (3.3)	4 (9.1)	3 (6.2)
		Yes, surgical/radiological drainage (CD 3)	3 (3.3)	2 (4.5)	4 (8.3)
		Yes, critical care admission (CD 4)	0 (0.0)	3 (6.8)	3 (6.2)
		Yes, resulting in death (CD 5)	12 (13.3)	4 (9.1)	4 (8.3)
	Anastomotic leak	No	77 (85.6)	32 (74.4)	40 (76.9)
		Yes, no intervention required (CD 1)	0 (0.0)	1 (2.3)	2 (3.8)
		Yes, drug treatment only (CD 2)	0 (0.0)	0 (0.0)	0 (0.0)
		Yes, intervention required (CD 3)	2 (2.2)	1 (2.3)	4 (7.7)
		Yes, critical care admission &/or intervention (CD 4)	0 (0.0)	4 (9.3)	3 (5.8)
		Yes, resulting in death (CD 5)	11 (12.2)	5 (11.6)	3 (5.8)
	Post-op bleed	No	81 (88.0)	42 (93.3)	43 (76.8)
		Yes, no intervention required (CD 1)	1 (1.1)	0 (0.0)	0 (0.0)
		Yes, transfusion only (CD 2)	3 (3.3)	0 (0.0)	3 (5.4)
		Yes, surgical/radiological intervention required (CD 3)	3 (3.3)	0 (0.0)	2 (3.6)
		Yes, critical care admission &/or intervention (CD 4)	0 (0.0)	1 (2.2)	5 (8.9)
		Yes, resulting in death (CD 5)	4 (4.3)	2 (4.4)	3 (5.4)

CD, Clavien-Dindo complication grade; OSI, organ space infection. Data are n (%).

**Figure S7. Hospital type and facilities for centres treating colorectal and gastric cancer, stratified by country income group.**



MDT, multidisciplinary team.

**Table S10. Summary of hospital care services for centres treating gastric and colon cancer stratified by country income group.**

WB income (tertile)		High	Upper middle	Low/lower middle	Total
		N=232	N=72	N=95	N=399
Hospital type	Non-referral hospital	25 (10.8)	5 (6.9)	7 (7.4)	37 (9.3)
	Referral hospital	54 (23.3)	47 (65.3)	70 (73.7)	171 (42.9)
	Specialist cancer hospital (Not sampled)	9 (3.9)	7 (9.7)	11 (11.6)	27 (6.8)
Hospital catchment	< 50 000	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	50 000 - 199 999	5 (2.2)	9 (12.5)	22 (23.2)	36 (9.0)
	200 000 - 499 999	31 (13.4)	12 (16.7)	7 (7.4)	50 (12.5)
	500 000 - 999 999	29 (12.5)	2 (2.8)	7 (7.4)	38 (9.5)
	1 000 000 - 1 999 999	13 (5.6)	11 (15.3)	12 (12.6)	36 (9.0)
	Over 2 000 000 (Not sampled)	6 (2.6)	11 (15.3)	10 (10.5)	27 (6.8)
	4 (1.7)	14 (19.4)	30 (31.6)	48 (12.0)	
MDT / Tumour board	None	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	Yes, for some cancers	2 (0.9)	12 (16.7)	23 (24.2)	37 (9.3)
	Yes, for all cancers (Not sampled)	16 (6.9)	22 (30.6)	39 (41.1)	77 (19.3)
Oncologist	Not available	70 (30.2)	25 (34.7)	26 (27.4)	121 (30.3)
	Available in hospital (Not sampled)	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	Not available	6 (2.6)	11 (15.3)	24 (25.3)	41 (10.3)
Palliative care specialist	Available in hospital (Not sampled)	82 (35.3)	40 (55.6)	57 (60.0)	179 (44.9)
	Not available	144 (62.1)	21 (29.2)	14 (14.7)	179 (44.9)
	Available in hospital (Not sampled)	23 (9.9)	32 (44.4)	52 (54.7)	107 (26.8)
CT scan	On site, not always available	65 (28.0)	27 (37.5)	36 (37.9)	128 (32.1)
	On site, always available (Not sampled)	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	No CT scan	0 (0.0)	3 (4.2)	17 (17.9)	20 (5.0)
Access to opioid medication	On site, not always available	4 (1.7)	7 (9.7)	16 (16.8)	27 (6.8)
	On site, always available (Not sampled)	84 (36.2)	49 (68.1)	55 (57.9)	188 (47.1)
	No	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	Yes, some of the time	0 (0.0)	1 (1.4)	2 (2.1)	3 (0.8)
Designated perioperative recovery area	Yes, all of the time (Not sampled)	7 (3.0)	11 (15.3)	39 (41.1)	57 (14.3)
	Yes, some of the time	81 (34.9)	47 (65.3)	47 (49.5)	175 (43.9)
	Yes, all of the time (Not sampled)	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	No	2 (0.9)	5 (6.9)	7 (7.4)	14 (3.5)
Highest level of postoperative care	Yes, some of the time	3 (1.3)	8 (11.1)	17 (17.9)	28 (7.0)
	Yes, all of the time (Not sampled)	83 (35.8)	46 (63.9)	64 (67.4)	193 (48.4)
	Ward level only	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
Pathology services	ICU/HDU (Not sampled)	7 (3.0)	16 (22.2)	30 (31.6)	53 (13.3)
	Not available	81 (34.9)	43 (59.7)	58 (61.1)	182 (45.6)
	Available at another hospital	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	On site, not always available	0 (0.0)	1 (1.4)	3 (3.2)	4 (1.0)
Radiotherapy	Available at another hospital	8 (3.4)	7 (9.7)	16 (16.8)	31 (7.8)
	On site, always available (Not sampled)	16 (6.9)	4 (5.6)	9 (9.5)	29 (7.3)
	No radiotherapy available	64 (27.6)	47 (65.3)	60 (63.2)	171 (42.9)
	> 50 km from hospital	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	10 - 50 km from hospital	1 (0.4)	2 (2.8)	16 (16.8)	19 (4.8)
	Within 10 km from hospital	15 (6.5)	6 (8.3)	19 (20.0)	40 (10.0)
	Radiotherapy on site (Not sampled)	12 (5.2)	8 (11.1)	12 (12.6)	32 (8.0)
Chemotherapy	Within 10 km from hospital	19 (8.2)	16 (22.2)	10 (10.5)	45 (11.3)
	Chemotherapy on site (Not sampled)	41 (17.7)	27 (37.5)	31 (32.6)	99 (24.8)
	No chemotherapy available	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	> 50 km from hospital	0 (0.0)	2 (2.8)	2 (2.1)	4 (1.0)
	10 - 50 km from hospital	0 (0.0)	1 (1.4)	11 (11.6)	12 (3.0)
Postoperative care infrastructure	Within 10 km from hospital	2 (0.9)	4 (5.6)	8 (8.4)	14 (3.5)
	Chemotherapy on site (Not sampled)	11 (4.7)	9 (12.5)	7 (7.4)	27 (6.8)
	Absent	75 (32.3)	43 (59.7)	60 (63.2)	178 (44.6)
Cancer care pathway	Present (Not sampled)	144 (62.1)	13 (18.1)	7 (7.4)	164 (41.1)
	Absent	47 (20.3)	32 (44.4)	57 (60.0)	136 (34.1)
	Present (Not sampled)	41 (17.7)	25 (34.7)	30 (31.6)	96 (24.1)
		144 (62.1)	15 (20.8)	8 (8.4)	167 (41.9)

**Table S11. 30-day mortality in patients who sustained a major complication. Capacity to rescue models. Figure 5A uses the multilevel model. Figure 5C and 5D use the multivariable and multivariable including postoperative care infrastructure models.**

Dependent: 30-day mortality		Alive	Dead	OR (univariable)	OR (multivariable)	OR (multivariable including postoperative care infrastructure)	OR (multilevel)
WB income (tertile)	High	572 (82.5)	121 (17.5)	-	-	-	-
	Upper middle	93 (61.6)	58 (38.4)	2.95 (2.01-4.31, p<0.001)	3.64 (2.29-5.78, p<0.001)	3.04 (1.84-4.99, p<0.001)	3.89 (2.08-7.29, p<0.001)
	Low/lower middle	137 (58.8)	96 (41.2)	3.31 (2.39-4.59, p<0.001)	5.28 (3.34-8.41, p<0.001)	4.46 (2.74-7.31, p<0.001)	6.15 (3.26-11.59, p<0.001)
Age (years)	Mean (SD)	66.0 (12.7)	70.2 (14.8)	1.03 (1.01-1.04, p<0.001)	1.03 (1.02-1.05, p<0.001)	1.03 (1.02-1.05, p<0.001)	1.03 (1.01-1.05, p<0.001)
Sex	Male	488 (74.3)	169 (25.7)	-	-	-	-
	Female	314 (74.9)	105 (25.1)	0.97 (0.73-1.28, p=0.808)	0.80 (0.57-1.13, p=0.218)	0.82 (0.58-1.16, p=0.267)	0.80 (0.56-1.15, p=0.237)
Cancer type	Colorectal	682 (77.0)	204 (23.0)	-	-	-	-
	Gastric	120 (62.8)	71 (37.2)	1.98 (1.41-2.75, p<0.001)	1.75 (1.16-2.63, p=0.008)	1.79 (1.18-2.69, p=0.006)	1.81 (1.17-2.78, p=0.007)
ECOG performance status	0	335 (89.1)	41 (10.9)	-	-	-	-
	1	249 (78.5)	68 (21.5)	2.23 (1.47-3.42, p<0.001)	1.65 (1.04-2.63, p=0.033)	1.64 (1.04-2.61, p=0.036)	1.67 (1.03-2.71, p=0.037)
	2	118 (62.8)	70 (37.2)	4.85 (3.14-7.57, p<0.001)	2.87 (1.74-4.77, p<0.001)	2.86 (1.73-4.75, p<0.001)	3.01 (1.77-5.13, p<0.001)
	3/4	65 (42.8)	87 (57.2)	10.94 (6.98-17.42, p<0.001)	4.89 (2.88-8.38, p<0.001)	4.63 (2.72-7.98, p<0.001)	5.02 (2.83-8.91, p<0.001)
ASA	I	85 (81.7)	19 (18.3)	-	-	-	-
	II	349 (80.2)	86 (19.8)	1.10 (0.65-1.96, p=0.729)	1.05 (0.57-2.00, p=0.877)	1.04 (0.56-1.98, p=0.906)	1.02 (0.53-1.97, p=0.958)
	III	297 (72.4)	113 (27.6)	1.70 (1.01-3.00, p=0.055)	1.48 (0.77-2.91, p=0.244)	1.51 (0.79-2.98, p=0.220)	1.48 (0.73-2.98, p=0.274)
	IV	47 (51.6)	44 (48.4)	4.19 (2.23-8.13, p<0.001)	2.35 (1.06-5.29, p=0.037)	2.35 (1.06-5.33, p=0.037)	2.45 (1.03-5.82, p=0.042)
	V	5 (41.7)	7 (58.3)	6.26 (1.81-23.26, p=0.004)	2.19 (0.52-10.30, p=0.294)	2.09 (0.49-9.97, p=0.331)	2.67 (0.55-12.88, p=0.221)
Stage	I	212 (78.5)	58 (21.5)	-	-	-	-
	II	190 (78.5)	52 (21.5)	1.00 (0.65-1.53, p=0.999)	0.88 (0.53-1.44, p=0.608)	0.85 (0.51-1.40, p=0.519)	0.88 (0.52-1.47, p=0.614)
	III	297 (77.7)	85 (22.3)	1.05 (0.72-1.53, p=0.815)	0.87 (0.56-1.36, p=0.544)	0.85 (0.54-1.33, p=0.463)	0.84 (0.52-1.34, p=0.458)
	IV	100 (56.5)	77 (43.5)	2.81 (1.86-4.28, p<0.001)	1.84 (1.09-3.09, p=0.022)	1.80 (1.07-3.03, p=0.027)	1.80 (1.04-3.12, p=0.036)
Urgency	Elective	673 (79.6)	173 (20.4)	-	-	-	-
	Emergency	129 (55.8)	102 (44.2)	3.08 (2.26-4.19, p<0.001)	2.18 (1.49-3.20, p<0.001)	2.21 (1.50-3.25, p<0.001)	2.40 (1.59-3.62, p<0.001)
Postoperative care infrastructure	Absent	126 (57.5)	93 (42.5)	-	-	-	-
	Present	676 (78.8)	182 (21.2)	0.36 (0.27-0.50, p<0.001)	-	0.64 (0.41-0.98, p=0.040)	-

OR, odds ratio. ASA, American Society of Anesthesiologists operative risk grade; ECOG, Eastern Cooperative Oncology Group; SD, standard deviation. Data are n (%) and OR (95% confidence interval, p-value). Multilevel model includes hospital and country as random intercepts.

**Table S12. 3-way mediation decomposition of proportion of effect of country income group on 30-day mortality mediated by the absence of postoperative care infrastructure. No significant exposure-mediator interaction was seen so a two-way decomposition is presented. Variables in the Table S11 multivariable model were included as covariates. Given that the potential mediator in this case is a hospital-level factor, it was assumed that there was no causal relationship between this and covariates at the patient level. Similarly, no mediator-outcome confounders were specified. These models therefore represent the change in country income group coefficients on the introduction of the postoperative care infrastructure variable. Uncertainty was determined using bootstrap resampling (5000 draws) and confidence intervals constructed using percentiles.**

<b>Low/lower middle</b>	<b>median</b>	<b>lower 95% CI</b>	<b>upper 95% CI</b>	<b>p</b>
Total natural effect	5.50	3.36	8.97	
Total natural direct effect	4.62	2.78	7.83	
Total natural indirect effect	1.19	1.01	1.42	0.040
Proportion of total effect which is indirect	0.10	0.002	0.22	0.040

<b>Upper middle</b>	<b>median</b>	<b>lower 95% CI</b>	<b>upper 95% CI</b>	<b>p</b>
Total natural effect	3.75	2.27	5.81	
Total natural direct effect	3.15	1.89	5.15	
Total natural indirect effect	1.19	1.01	1.42	0.040
Proportion of total effect which is indirect	0.14	0.003	0.32	0.040

**Table S13. Absolute risk difference for 30-day mortality after major complication in the presence of consistently available postoperative care infrastructure. Probabilities are predicted from multivariable model in table S11 at fixed covariate levels as indicated. Confidence intervals and two-sided p-values are generated from bootstrap resampling (5000 replications).**

WB income (tertile)	Age (years)	Sex	Cancer type	ECOG performance status			Urgency	Postoperative care infrastructure	Predicted probability of death	Absolute difference (95% confidence interval, p-value)	Number needed to treat (benefit) (95% confidence interval)
				ASA	Stage						
Low/lower middle	55	Male	Gastric	1	II	II	Elective	Present	0.287 (0.155 to 0.440)	-	-
Low/lower middle	55	Male	Gastric	1	II	II	Elective	Absent	0.383 (0.234 to 0.556)	0.096 (0.002 to 0.199, p=0.048)	10 (581 to 5, p=0.048)
Upper middle	55	Male	Gastric	1	II	II	Elective	Present	0.213 (0.097 to 0.375)	-	-
Upper middle	55	Male	Gastric	1	II	II	Elective	Absent	0.298 (0.146 to 0.486)	0.081 (0.002 to 0.177, p=0.045)	12 (540 to 6, p=0.045)
High	55	Male	Gastric	1	II	II	Elective	Present	0.082 (0.037 to 0.147)	-	-
High	55	Male	Gastric	1	II	II	Elective	Absent	0.123 (0.052 to 0.228)	0.038 (-0.000 to 0.104, p=0.052)	26 (-2623 to ∞ to 10, p=0.052)
Low/lower middle	55	Male	Colorectal	1	II	II	Elective	Present	0.182 (0.099 to 0.291)	-	-
Low/lower middle	55	Male	Colorectal	1	II	II	Elective	Absent	0.259 (0.153 to 0.377)	0.075 (-0.001 to 0.153, p=0.051)	13 (-1608 to ∞ to 7, p=0.051)
Upper middle	55	Male	Colorectal	1	II	II	Elective	Present	0.132 (0.059 to 0.233)	-	-
Upper middle	55	Male	Colorectal	1	II	II	Elective	Absent	0.192 (0.098 to 0.321)	0.057 (0.000 to 0.133, p=0.050)	17 (27205 to 7, p=0.050)
High	55	Male	Colorectal	1	II	II	Elective	Present	0.048 (0.023 to 0.080)	-	-
High	55	Male	Colorectal	1	II	II	Elective	Absent	0.073 (0.034 to 0.126)	0.024 (0.001 to 0.063, p=0.044)	42 (1661 to 16, p=0.044)
Low/lower middle	55	Female	Gastric	1	II	II	Elective	Present	0.246 (0.128 to 0.398)	-	-
Low/lower middle	55	Female	Gastric	1	II	II	Elective	Absent	0.339 (0.196 to 0.506)	0.090 (0.001 to 0.188, p=0.049)	11 (1384 to 5, p=0.049)
Upper middle	55	Female	Gastric	1	II	II	Elective	Present	0.182 (0.083 to 0.333)	-	-
Upper middle	55	Female	Gastric	1	II	II	Elective	Absent	0.259 (0.125 to 0.438)	0.073 (-0.001 to 0.166, p=0.051)	14 (-1278 to ∞ to 6, p=0.051)
High	55	Female	Gastric	1	II	II	Elective	Present	0.068 (0.029 to 0.127)	-	-
High	55	Female	Gastric	1	II	II	Elective	Absent	0.103 (0.043 to 0.197)	0.032 (-0.000 to 0.090, p=0.052)	31 (-4042 to ∞ to 11, p=0.052)
Low/lower middle	55	Female	Colorectal	1	II	II	Elective	Present	0.155 (0.080 to 0.250)	-	-
Low/lower middle	55	Female	Colorectal	1	II	II	Elective	Absent	0.223 (0.123 to 0.335)	0.066 (-0.001 to 0.141, p=0.051)	15 (-1725 to ∞ to 7, p=0.051)
Upper middle	55	Female	Colorectal	1	II	II	Elective	Present	0.111 (0.050 to 0.200)	-	-

Upper middle	55	Female	Colorectal	1	II	II	Elective	Absent	0.163 (0.083 to 0.278)	0.049 (0.001 to 0.118, p=0.046)	20 (1368 to 8, p=0.046)
High	55	Female	Colorectal	1	II	II	Elective	Present	0.039 (0.018 to 0.068)	-	-
High	55	Female	Colorectal	1	II	II	Elective	Absent	0.060 (0.027 to 0.109)	0.019 (0.000 to 0.053, p=0.048)	52 (4332 to 19, p=0.048)



### Case ascertainment

Case ascertainment was performed by independent validators in contributing hospitals to determine the proportion of patients meeting the inclusion criteria who were actually enrolled. Validators were asked to provide this information prior to receiving patient-level information for later validation steps. Case ascertainment was performed in a random sample of 265 hospitals (high 156, upper middle 48, low/lower middle 61, as defined by the World Bank country income groups) in 69 countries representing 1060 hospital-weeks of data collection. The validation cohort were representative of the primary data collected by 838 mini-teams (Figure S6).

In primary data collection for the main study, there were 3669 patients included across hospitals selected for validation. Validators identified 3805 cases that fulfilled inclusion criteria for the validation period, equating to a case ascertainment rate of 96.4% (3669/3805). There was no difference in case ascertainment rates between World Bank country income groups (chi-squared statistic 1.04, df 2, p=0.595).

There was little variability in case ascertainment across all hospitals (min 30%, lower quartile 100%, median 100%, upper quartile 100%, max 100%) (Figure S7).

**Figure S8. Distribution of patients enrolled per hospital in validation sample.**

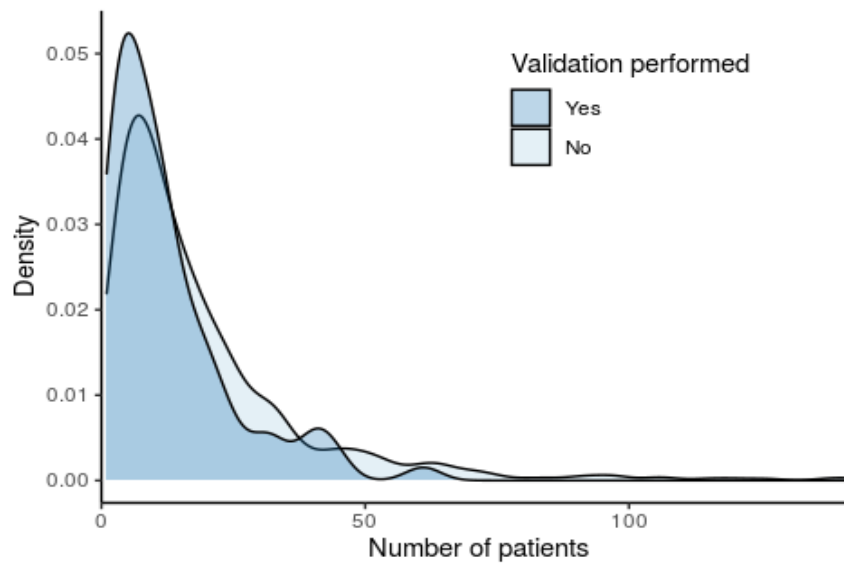
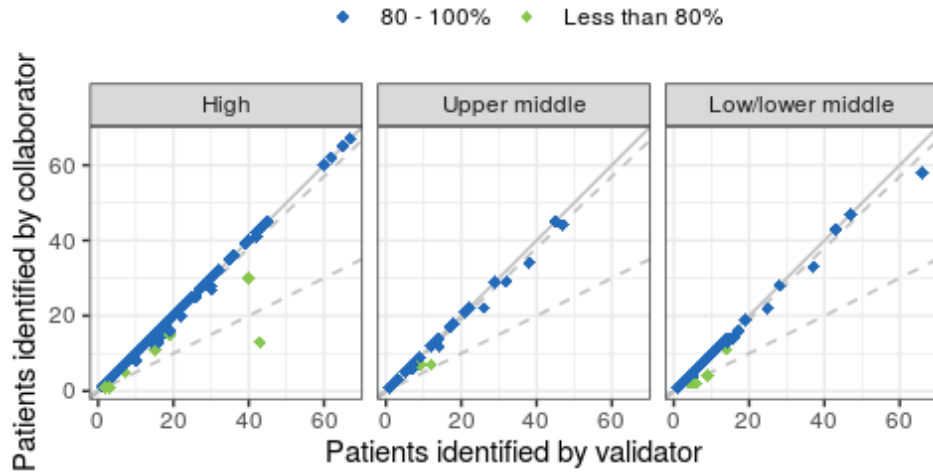


Figure S9. Case ascertainment. Correlation of number of patients fulfilling inclusion criteria identified by validators against those included in primary data collection. Dotted lines represent 50% and 95% concordance.



### Data accuracy

A subset of variables was re-collected by data validators who were independent of the primary data collection process. Following case ascertainment (above), validators were provided with the following patient variables: hospital ID, age, gender, date of admission, date of operation, cancer type and primary operation name. These data were complete in the primary dataset. Using this information, validators were asked to confirm the following variables from the patient's paper or electronic notes: two patient variables (age and gender), one disease-specific variable (pathological stage), two operation variables (urgency and operative intent), and two outcome measures (30-day major complication and 30-day mortality).

Availability of sampled variables is detailed in table S16. Overall availability of variables for validation was good (Table S16). However, there was some difficulty in low/lower middle-income countries, with some validators commenting about on the lack of availability of reliable written notes. This pattern was reflected particularly in operation records. The ability of validators to identify outcome measures was lower across all countries (30-day major complication available, high 87.9%, upper middle 86.6%, low/lower middle 79.6% World Bank income group; Table S16).

**Table S14. Availability of sampled variables to validators by country income group.**

		World Bank income group			p*
		High N=2569	Upper middle N=536	Low/lower middle N=564	
Pathological staging available	No	128 (5.0)	13 (2.4)	79 (14.0)	<0.001
	Yes	2441 (95.0)	523 (97.6)	485 (86.0)	
Urgency available	No	32 (1.2)	5 (0.9)	7 (1.2)	0.854
	Yes	2537 (98.8)	531 (99.1)	557 (98.8)	
Operative intent	No	175 (6.8)	5 (0.9)	52 (9.2)	<0.001
	Yes	2393 (93.2)	531 (99.1)	512 (90.8)	
30-day major complication available	No	312 (12.1)	72 (13.4)	115 (20.4)	<0.001
	Yes	2256 (87.9)	464 (86.6)	448 (79.6)	
30-day mortality available	No	158 (6.2)	19 (3.5)	79 (14.0)	<0.001
	Yes	2410 (93.8)	517 (96.5)	485 (86.0)	

\*Chi-squared or Fisher's exact test where expected cell count <5. Data are n (%).

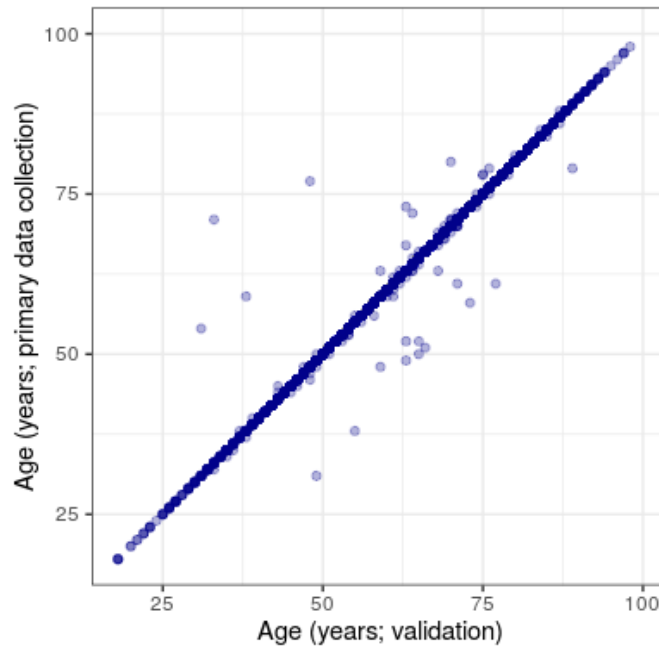
*Data accuracy: continuous data*

Age was the only continuous variable which was validated. Validator versus primary data were highly correlated (Pearson correlation coefficient 0.997, 95% CI 0.996 to 0.997) (Table S17; Figure S8).

**Table S15. Validation study for continuous variable**

	Primary data	Validation data	Pearson correlation coefficient (95% CI)
Age; mean (standard deviation)	62.2 (14.0)	62.3 (14.0)	0.997 (0.996 to 0.997)

**Figure S10. Correlation of patient age in validation vs primary datasets (n=4520)**



*Data accuracy: categorical data*

For categorical variables, agreement between validation and primary data is described using the Cohen’s kappa coefficient. Guidelines on the interpretation of agreement with the kappa coefficient are poor (<0.20), fair (0.20 to 0.40), moderate (0.41 to 0.60), good (0.61 to 0.80), and very good (0.80 to 1.00).<sup>1</sup>

There was good or very good agreement between validation and primary data for patient (gender, kappa coefficient 0.99), operative (urgency 0.77; intent 0.75) and cancer staging (pT stage 0.93; pN stage 0.67) variables (Table S18). Agreement for 30-day mortality (0.89) was also excellent, however, for 30-day major complication (0.63) the agreement was lower.

**Table S16. Validation study for categorical variables**

	Primary data	Validation data					Kappa
	Sex	Female Male	Female 2564 6			Male 1 1093	
Pathological T stage	T0	139	20	6	4	1	0.93
	T1	9	707	29	12	4	
	T2	9	41	709	34	6	
	T3	4	12	19	798	11	
	T4	2	3	5	18	371	
Pathological N stage	N0	1326	131	54	15		0.67
	N1	177	482	66	17		
	N2	71	67	243	37		
	N3	3	4	3	34		
Urgency	Elective Emergency	Elective 3270 55			Emergency 71 229		0.77
Intent	Curative Palliative	Curative 3066 61			Palliative 77 231		0.75
30-day major complication	No	No 2639			Yes 119		0.63
	Yes	Yes 96			Yes 220		
30-day mortality	Alive	Alive 3321			Died 9		0.89
	Died	Died 4			Died 55		

Data are counts.

1. Altman DG. Practical Statistics for Medical Research. Chapman and Hall; 2020. 650 p.

## Authorship

### Writing group

Stephen R Knight MBChB (Hons)<sup>1</sup>, Catherine A Shaw PhD<sup>1</sup>, Riinu Pius PhD<sup>1</sup>, Thomas M Drake MBChB<sup>1</sup>, Lisa Norman PhD<sup>1</sup>, Adesoji O Ademuyiwa FWACS<sup>2</sup>, Adewale O Adisa FWACS<sup>3</sup>, Maria-Lorena Aguilera-Arévalo MSCE<sup>4</sup>, Sara W Al-Saqqa MD<sup>5</sup>, Ibrahim S Al-Slaibi MD<sup>6</sup>, Aneel Bhangu FRCS<sup>7</sup>, Bruce M Biccard PhD<sup>8</sup>, Peter Brocklehurst MSc<sup>7</sup>, Ainhoa Costas-Chavarri MD<sup>9</sup>, Kathryn M Chu MD<sup>10</sup>, Anna J Dare PhD<sup>11</sup>, Muhammed Elhadi MBBCh<sup>12</sup>, Cameron J Fairfield MSc<sup>13</sup>, J Edward Fitzgerald MRCS<sup>14</sup>, Dhruv N Ghosh MCh<sup>15</sup>, James Glasbey MRCS<sup>7</sup>, Mark I. van Berge Henegouwen PhD<sup>16</sup>, J.C Allen Ingabire MMED<sup>17</sup>, T Peter Kingham MD<sup>18</sup>, Marie Carmela M Lapitan MD<sup>19</sup>, Ismaïl Lawani MD<sup>20</sup>, Bettina Lieske FRCS<sup>21</sup>, Richard Lilford FFPH<sup>7</sup>, Janet Martin PharmD<sup>22</sup>, Kenneth A Mclean MBChB<sup>13</sup>, Rachel L Moore FCS(SA)<sup>23</sup>, Dion Morton FRCS<sup>7</sup>, Dmitri Nepogodiev MBChB<sup>7</sup>, Faustin Ntirenganya FCS(ECSA)<sup>24</sup>, Francesco Pata MD<sup>25,26</sup>, Thomas D Pinkney FRCS<sup>7</sup>, Ahmad U Qureshi FACS<sup>27</sup>, Antonio Ramos-De la Medina FACS<sup>28</sup>, Aya M Riad BMedSci<sup>29</sup>, Hosni Khairy Salem MD<sup>30</sup>, Joana Simões MD<sup>7,31</sup>, Richard T Spence PhD<sup>32</sup>, Neil J Smart FRCSEd<sup>33</sup>, Stephen Tabiri PhD<sup>34</sup>, Hannah S Thomas MS<sup>29</sup>, Thomas G Weiser MD<sup>35,36</sup>, Malcolm A West PhD<sup>37</sup>, John Whitaker BMBS<sup>38</sup>, Ewen M Harrison PhD<sup>1</sup>

1. National Institute for Health Research Global Health Research Unit on Global Surgery, Centre for Medical Informatics, Usher Institute, University of Edinburgh, UK.
2. Paediatric Surgery Unit, Department of Surgery, Faculty of Clinical Sciences, College of Medicine, University of Lagos, Lagos, Nigeria.
3. Department of Surgery, Obafemi Awolowo University, Ile-Ife, 220005, Osun State, Nigeria.
4. Departamento de Cirugía, Hospital General San Juan De Dios, Universidad de San Carlos de Guatemala, 1 avenida 1-50 zona 1, Guatemala, Guatemala.
5. Dar Al-Shifa Hospital, Gaza.
6. Department of Surgery, Al-Makassed Hospital, Jerusalem, Palestine.
7. National Institute for Health Research Global Health Research Unit on Global Surgery, 2nd Floor, Institute of Translational Medicine, Mindelsohn Way, Birmingham, UK.
8. Department of Anaesthesia and Perioperative Medicine, Groote Schuur Hospital and University of Cape Town. Anzio Road, Observatory, Western Cape, South Africa.
9. Department of Surgery, Rwanda Military Hospital, Kigali, Rwanda.
10. Centre for Global Surgery, Department of Global Health, Stellenbosch University, South Africa.
11. Department of Surgery, University of Toronto, Toronto, ON, Canada.
12. Faculty of Medicine, University of Tripoli, Tripoli, Libya.
13. Centre for Medical Informatics, Usher Institute, University of Edinburgh, UK.
14. Lifebox Foundation, Charlotte Street, UK.
15. India Hub, National Institute for Health Research Global Health Research Unit on Global Surgery, Christian Medical College, Ludhiana, India.
16. Amsterdam UMC, location AMC, University of Amsterdam, Department of Surgery, Cancer Center Amsterdam, Amsterdam, Netherlands.
17. Department of Surgery, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda.
18. Department of Surgery, Memorial Sloan Kettering Cancer Center, New York, NY, USA.
19. National Institutes of Health - University of the Philippines Manila, Manila, Philippines.
20. Visceral Surgery Unit, Department of Surgery and Surgical Specialties, Faculty of Health Sciences, University of Abomey-Calavi, Cotonou, Republic of Benin.
21. Division of Colorectal Surgery, University Surgical Cluster, National University Hospital, Singapore.
22. Department of Anesthesia & Perioperative Medicine, and Centre for Medical Evidence, Decision Integrity & Clinical Impact, Western University, Ontario, Canada.
23. Acute Care Surgery Unit, Department of Surgery, Chris Hani Baragwanath Academic Hospital & School of Clinical Medicine, University of the Witwatersrand, Johannesburg, South Africa.

24. Department of Surgery, School of Medicine and Pharmacy, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda.
25. Department of Surgery, Nicola Giannettasio Hospital, Corigliano-Rossano, Italy.
26. La Sapienza University, Rome, Italy.
27. Department of Surgery, Services Institute of Medical Sciences, Lahore, Pakistan.
28. Global Surgery Research Centre. Hospital Español de Veracruz. Veracruz, Mexico.
29. Edinburgh Medical School, College of Medicine and Veterinary Medicine, University of Edinburgh, UK.
30. Cairo Faculty of Medicine, Cairo, Egypt.
31. Hospital Garcia de Orta, Almada, Portugal.
32. General and Gastrointestinal Surgery, Dalhousie University, Halifax, Nova Scotia, Canada.
33. Exeter Surgical Health Services Research Unit (HeSRU), Royal Devon and Exeter Hospital, Barrack Road, Exeter, Devon, UK.
34. Department of Surgery, School of Medicine, University for Development Studies and Tamale Teaching Hospital, Tamale, Ghana.
35. Department of Surgery, Stanford University, Stanford, USA.
36. Department of Clinical Surgery, University of Edinburgh, UK.
37. Academic Unit of Cancer Sciences, Faculty of Medicine, University of Southampton, Southampton, UK & Acute Perioperative and Critical Care Research Group, Southampton NIHR Biomedical Research Centre, University of Southampton NHS Foundation Trust, Southampton, UK.
38. King's Centre for Global Health and Health Partnerships, School of Population Health & Environmental Sciences, Faculty of Life Sciences and Medicine, King's College London, UK.

#### Contributions

EMH: Study design, data collection, data analysis, data interpretation, and writing.  
 AOAd: Study design, data collection, and writing.  
 AOAdi: study design, data interpretation, and writing.  
 MLAA: Study design, data collection, data analysis, data interpretation, and writing.  
 SWA-S: Data collection, data interpretation, and writing.  
 ISA-S: Data collection, data interpretation, and writing.  
 MIVBH: Study design, data collection, data analysis, data interpretation, and writing.  
 AB: Study design, data collection, data interpretation, and writing.  
 BMB: Study design, and writing.  
 PB: Study design, data collection, data analysis, data interpretation, and writing.  
 KMC: Study design, data collection, data interpretation, and writing.  
 AC-C: Study design, data collection, data interpretation, and writing.  
 AJD: Data collection, data interpretation, and writing.  
 TMD: Study design, data interpretation, and writing.  
 ME: Data collection, data interpretation, writing, and revision.  
 CJF: Study design, data collection, and data interpretation.  
 JEF: Study design, data collection, data analysis, data interpretation, and writing.  
 DNG: Data analysis, Data interpretation, and writing.  
 JG: Study design, data collection, data interpretation, and writing.  
 JCAI: Study design, data interpretation, and writing.  
 TPK: Study design, data interpretation, and writing.  
 SRK: Study design, data collection, data analysis, data interpretation, and writing.  
 MCML: Study design, data collection, data interpretation, and writing.  
 IL: Study design, data collection, data interpretation, and writing.  
 BL: Data collection, data interpretation, writing, and revision.  
 RJL: Study design, data interpretation, and writing.  
 JM: Study design and data interpretation.  
 KAM: Study design, data collection, data analysis, data interpretation, and writing.  
 RLM: Data collection  
 DM: Study design, data interpretation, and writing.  
 DN: Study design, data collection, data interpretation, and writing.  
 LN: Data analysis and data interpretation.  
 FN: Data collection, data interpretation, and writing.  
 FP: Study design, data collection, data analysis, data interpretation, and writing.

TDP: Data collection, data interpretation, and writing.  
RP: Study design, data analysis, data interpretation, and writing.  
AUQ: Study design, data collection, and manuscript revisions.  
ARM: Study design, data collection, data analysis, data interpretation, and writing.  
AMR: Data analysis and data interpretation.  
CAS: Study design, data analysis, data interpretation, and writing.  
JS: Data interpretation and writing.  
NJS: Study design, data collection, data analysis, data interpretation, and writing.  
RTS: Study design, data collection, and data interpretation.  
ST: Study design, data collection, data analysis, data interpretation, and writing.  
HST: Study design, data collection, data analysis, data interpretation, and writing.  
TGW: Study design, data collection, data analysis, data interpretation, and writing.  
MAW: Data interpretation, writing and critical review.  
JW: Data collection and revisions.

#### Conflicts of interest

Dr. van Berge Henegouwen reports personal fees from Mylan, personal fees from Alesi Surgical, personal fees from Johnson and Johnson, grants and non-financial support from Stryker, personal fees from Medtronic, grants from Olympus, outside the submitted work; all fees paid to employing institution.

Dr. Brocklehurst reports grants and personal fees from MRC, grants from MRC, NIHR HTA, Wellcome Trust, personal fees from AG Biotest, outside the submitted work.

Dr. Kingham reports personal fees from Olympus Surgical outside the submitted work.

All other authors report no conflicting interests

#### National Leads

**Albania:** Arben Gjata; **Argentina:** Maria Marta Modolo; **Australia:** Sebastian King, Erick Chan; **Bangladesh:** Sayeda Nazmun Nahar; **Barbados:** Ade Waterman; **Belgium:** Dominique Vervoort; **Benin:** Ismaïl Lawani; **Botswana:** Alemayehu Ginbo Bedada; **Brazil:** Bernardo De Azevedo, Ana Gabriela Figueiredo; **Bulgaria:** Manol Sokolov; **Burundi:** Venerand Barendegere; **Cameroon:** Gerald Ekwen; **Canada:** Arnav Agarwal, Anna Dare; **China:** Qinyang Liu; **Colombia:** Juan Camilo Correa; **Congo, Dem. Rep.:** Kalisya Luc Malemo, Jacques Bake; **Croatia:** Jakov Mihanovic; **Czech Republic:** Kamila Kunčarová, Julius Orhalmi; **Egypt:** Hosni Salem; **Estonia:** Jyri Teras; **Finland:** Aristotelis Kechagias; **France:** Alexis P Arnaud; **Germany:** Judith Lindert; **Ghana:** Stephen Tabiri; **Greece:** Vasileios Kalles; **Guatemala:** Maria-Lorena Aguilera-Arevalo, Gustavo Recinos; **Hungary:** Zsolt Baranyai; **India:** Basant Kumar, Harish Neelamraju Lakshmi, Sanoop Koshy Zachariah, Philip Alexander, Sunil Kumar Venkatappa, C Pramesh; **Indonesia:** Radhian Amandito; **Ireland:** Christina Fleming; **Italy:** Luca Ansaloni, Francesco Pata, Gianluca Pellino; **Jordan:** Ahmed M. Altibi, Ibrahim Nour; **Kenya:** Intisar Hamdun; **Libya:** Muhammed Elhadi, Ali M. Ghellai; **Lithuania:** Donatas Venskutonis, Tomas Poskus, Justas Zilinskas; **Madagascar:** John Whitaker; **Malawi:** Precious Malemia; **Malaysia:** Yong Yong Tew; **Malta:** Elaine Borg, Sarah Ellul; **Mexico:** Antonio Ramos-De la Medina; **Morocco:** Fatima Zahraa Wafqui; **Namibia:** David W Borowski; **Netherlands:** Anne Sophie van Dalen; **New Zealand:** Cameron Wells; **Niger:** Harissou Adamou; **Nigeria:** Adesoji Ademuyiwa, Adewale Adisa; **Norway:** Kjetil Søreide; **Pakistan:** Ahmad Uzair Qureshi; **Palestine:** Ibrahim Al-Slaibi, Sara Al Saqqa, Osaid Alser, Haya Tahboub; **Paraguay:** Helmut Alfredo Segovia Lohse; **Peru:** Sebastian Shu Yip; **Philippines:** Marie Carmela Lapitan; **Poland:** Piotr Major; **Portugal:** Joana Simões, António Sampaio Soares; **Romania:** Matei Razvan Bratu; **Russian Federation:** Andrey Litvin, Armen Vardanyan; **Rwanda:** JC Allen Ingabire, Ainhoa Costas-Chavarri; **Saudi Arabia:** Ahmad Gudal, Naif Albati; **Serbia:** Jovan Juloski; **Singapore:** Bettina Lieske; **Slovenia:** Miran Rems; **South Africa:** Sarah Rayne, Stephanie Van Straten, Yoshan Moodley, Kathryn Chu, Rachel Moore; **Spain:** Irene Ortega Vázquez, Jaime Ruiz-Tovar; **Sri Lanka:** Kithsiri Janakantha Senanayake, Sujeewa Priyantha Bandara Thalaspitiya; **Sudan:** Omer Abdelbagi Omer, Anmar Homeida; **Sweden:** Yucel Cengiz; **Switzerland:** Daniel Clerc; **Syrian Arab Republic:** Muhammad Alshaar; **Tunisia:** Hanen Bouaziz; **Turkey:** Yuksel Altinel; **Uganda:** Matthew Doe; **Ukraine:** Maryna Freigofer;



**United Kingdom:** Ella Teasdale, Rakan Kabariti, Joshua Michael Clements, Stephen Richard Knight, Ahsan Ashfaq; **United States:** Ijeoma Azodo; **Uruguay:** Gabriela Wagner, Ivan Trostchansky; **Zambia:** Mayaba Maimbo, David Linyama.

#### Local Collaborators

\* denotes Hospital Lead

**Albania:** Helidon Nina, Amanda Zeko (University Hospital Center Nene Tereza).

**Argentina:** Claudio Gabriel Fermani, Maria Marta Modolo, Santiago Villalobos (Hospital Luis Lagomaggiore); Federico Carballo, Pablo Farina, Sebastian Guckenheimer (Ignacio Pirovano).

**Australia:** Marilla Dickfos (Bundaberg Base Hospital); Ankit Ajmera, Chester Chong, Ralph Gourlay, Sikandar Hussaini, Yi Jia Lee, Adeeb Majid, Peter Martin, Rebecca Miles, Owen James Morris, Jamie Phua, William Ridley, Tarunpreet Saluja, Ryan Renxin Tan, Jen Teh, Anna Wells (Calvary Mater Newcastle); Bharti Arora, Qaasim Dollie, Debbie Ho\*, Yanru Ma, Omattage Mahasha Perera, Anthony Truong (Gold Coast University Hospital); Amanda Caroline Dawson\*, Bryan Lim, Upuli Pahalawatta, Jacqueline Phan, Xiao-Ming Sarah Woon-Shoo-Tong, Andrea Yeoh (Gosford Hospital); Lillian Charman, Andrew Drane, Sharon Laura, Charmaine Chu Wen Lo, Amy Mozes, Rita Poon\*, Hao Han Tan, Ellen Wall (Gosford Private Hospital); Prakshi Chopra, Jasmine De Giovanni, Bal Dhital, Brian Draganic, Alexander Duller, Jonathan Gani, Yao Kuan Goh, Jun Young Jeong, Brendan McManus, Prakash Nagappan, Peter Pockney, Anya Rugendyke, Mahsa Sarrami, Stephen Smith, Vanessa Wills, Hsu Ven Wong, Geoffrey Ye, Geoffrey Zhang (John Hunter Hospital); Ethan Brooker, Daniel Feng, Bonnie Lau, Carlin Ngai (Manning Base Hospital); Sarah Birks, David Gyorki, Jaime Otero de Pablos (Peter MacCallum Cancer Centre); Ali Abbosh, Chris Gillespie, Ahmed Mahmoud\* (Princess Alexandra Hospital); Bianca Kwan, Joshua Lawson, Andrea Warwick (Redcliffe Hospital); Janne Bingham, Andrew J Cockbain, Nagendra Naidu Dudi-Venkata, Jordan Ellaby-Hall, Ben Finlay, Emily Humphries, Jade Pisaniello, Monique Pisaniello, Salma Salih, Tarik Sammour\* (Royal Adelaide Hospital); Haidar Hadri Abd Wahab, April De Silva, Nicola Hayward, Kartik Iyer, Guy Maddern\*, Gian Andrea Prevost (The Queen Elizabeth Hospital); Naga Annapureddy, Krishna Pranathi Settipalli, Jeremy Yeo (The Wesley Hospital); Lucy Hempenstall, Lily Pham, Shaun Purcell (Toowoomba Hospital); Cherry Talavera, Ashish I Vaska (University Hospital Geelong); Gurpreet Chaggar, Phillip Chrapko, Annelise Cocco, Sarah Michelle Crystal Jade Coulter-Nile, Grahame Ctercteko, James French, Houchen Gong, Martijn Gosselink, Thuvarahan Jegathees, Ivan Jin, Michelle Kalachov, Kathryn Kiefhaber, Katherine Lee, Jason Luong, Steven Phan, Henry Pleass, Kelly Veale, Zhi Zeng (Westmead Hospital); Angela Au, Ashe DeBiasio, Idy Deng, Jananee Myooran, Amrita Nair, Peter Stewart\* (Wyong Public Hospital).

**Austria:** Anton Stift, Lukas Walter Unger, Kerstin Wimmer (General Hospital of Vienna).

**Bangladesh:** Nabila Ahmed, Syed Hasan, Saber Rahman (Bangladesh Medical College Hospital).

**Barbados:** Margaret O'Shea, Greg Padmore, Adrian Peters (Queen Elizabeth Hospital).

**Belgium:** Pietro Perduca, Guenda Pulcina, Nicolas Tinton (Grand Hopital de Charleroi - Site Saint-Joseph); Frederic Buxant, Elsa Dabin, Giulia Garofalo (Hôpitaux Iris Sud - Etterbeek-Ixelles).

**Benin:** Francis Dossou, Ismaïl Lawani (Centre Hospitalier Universitaire et Departemental Oueme Plateau); Freddy Houehanou Rodrigue Gngangnon, Yacoubou Imorou Souaibou (Centre National Hospitalier et Universitaire Hubert Koutoukou Maga).

**Botswana:** Alemayehu Ginbo Bedada\*, Pako Motlaleselelo, Omphile Tlhomelang (Princess Marina Hospital).

**Brazil:** Igor Lima Buarque, Gustavo Mendonça Ataíde Gomes, Aldo Vieira Barros (Hospital Santa Casa de Misericórdia de Maceio).

**Bulgaria:** Ilia Batashki, Nikolai Damianov, Vladislav Stoyanov (Medical Institute of Ministry of Interior); Dragomir Dardanov, Svilen Maslyankov, Plamen Petkov, Manol Sokolov, George Todorov, Evgeni Zhivkov (University Hospital Alexandrovska); Aygulya Akisheva, Miguel Angel Castilla Moreno, Geno Genov, Ivelina Ilieva, Tsvetomir Ivanov, Martin Karamanliev, Azhar Khan, Emil Mitkov, Tsanko Yotsov (University Hospital Dr Georgi Stranski); Boyko Atanasov, Nikolay Belev, Mihail Slavchev (University Hospital Eurohospital).

**Burundi:** Carlos Nsengiyumva (Kamenge Military Hospital).

**Cambodia:** Elgan Jones, Simon Stock (World Mate Emergency Hospital).

**Cameroon:** Gerald Ekwen, Steve Kyota (Baptist Hospital); James Brown, Tresor Mabanza K., Lemery Nigo Samuel, Chidi Otuneme, Ngwang Prosper, Franklin Umenze (Mbingo Baptist Hospital).

**Canada:** Marylise Boutros, Natasha Caminsky, Sinziana Dumitra, Richard Garfinkle, Dominique Morency, Ebram Salama (Jewish General Hospital); Alexander Banks, Lorenzo Ferri, Haitian He, Amit Katz, Alexander Sender Liberman, Sarkis Meterissian, Allison Pang, Elena Parvez (McGill University Health Center); Arnav Agarwal, Anna Dare, Usmaan Hameed, Fahima Osman, Sangita Sequeira (North York General Hospital); Natalie Coburn, Anna Dare, Alisha Jaffer, Paul Karanicolas (Sunnybrook Hospital); Matthew Mosseler, Reilly Musselman (The Ottawa Hospital).

**China:** Xinyuan Liu, Ching Wan Yip (Huashan Hospital affiliated to Fudan University).

**Colombia:** Juan Sebastian Garces-Otero, Carolina Guzman, Sebastian Sierra, Andres Uribe Valencia (CES Clinic); Paulo Andrés Cabrera Rivera, Saul Camelo, Andrea Gonzalez, Alejandro González-Orozco, Manuel Santiago Mosquera Paz, Carlos J- Perez Rivera (Fundacion Cardioinfantil-IC); Felipe Gonzalez, Andres Isaza-Restrepo, Laura Nino- Torres (Hospital Universitario Mayor Méderi); Natalia Arias Madrid, Maria Clara Mendoza Arango, Sebastian Sierra (Hospital Universitario San Vicente Fundacion).

**Congo, Dem. Rep.:** Jacques Bake, Justin Tsandiraki (HEAL Africa Hospital).

**Croatia:** Damir Jemendžić, Branislav Kocman, Oliver Šuman (Clinical Hospital Merkur); Renata Canic, Darko Jurišić, Ivana Karakas, Ana Krizanovic Rucpic, Vlatka Pitlovic, Josip Samardžić (General Hospital Dr. Josip Bencevic); Mario Kopljar (University Hospital Center Sestre milosrdnice); Ivan Bacic, Edgar Domini, Robert Karlo, Jakov Mihanovic\*, Danijela Miljanić, Andrea Simic (Zadar General Hospital).

**Czech Republic:** Mariam Ahmed, Majdi Al Nassrallah, Rabiya Altaf, Talal Amjad\*, Ruba Eltoum, Heba Haidar, Alhassan Hassan, Omar Khalil, Marwan Qasem, Rommel Ramesh, Gautham Sajith, Maham Wisal (Charles University Hospital); Jan Žatecký\* (Slezská nemocnice v Opavě, p.o.); Michele Bujda, Katerina Jirankova, Ales Paclik (The General University Hospital in Prague).

**Egypt:** Aya Abdallah, Mariam Abdulgawad Almogy, Esraa Ayman El-sawy, Ahmed Moustafa ElFayoumy, Nourhan Elghareeb, Nourhan Ahmed Esmat, Ahmed Fadel, Abdullah Habater, Heba Hamdy, Amr Hefni, Marwa Kamal, Norhan Mohamed Abobakr, Ahmed Sayed, Nancy Shaker, Ehab Taha, Hoda Tharwat, Omar Zakaria (Ain Shams University Specialized Hospital); Ibrahim Abdelmotaleb, Ali Al-Dhufri, Hamza S. Al-Himyari, Enas El sheikh, Asmaa Eldmaty, Aya Elkhalawy, Ahmed M.Elkhashen, Kithara Magdy, Safa Mostafa, Habib Doutoum Sadia, Mohamed mahmoud Saleh, Dina Samir, Mohamed Yahia Mohamed Ali (Al-Tagamoh Hospital); Mahmoud A. Nassar, Samar Abdelhady, Aly Abdelrazek, Israa Abdelsalam, Aya El-Sawy, Eman Essam, Mohamed Gadelkarim, Khaled Ghaly, Mohamed Hassabalnaby, Rana Masarani, Nourhan Mohamed Shaaban, Ahmed Sabry, Menatalla Salem, Nourhan Akram Soliman, Diaaaldin Zahran (Alexandria Main University Hospital); Moustafa Ramadan Abou El.soud, Esraa Tarek Badr, Hala Borham, Nehal Elmeslemany, Mohammad Elsayed, Fawzia Elsherif, Sara Eslam, Gehad Gaber, Sondos Ibrahim, Yara Kamh, Abdelrahman

Mahmoud, Shima gamal Mohamed, Eman Morshedy, Cinderella Omar, Fatima Salem Soliman (Alexandria Medical Research Institute); Shaza Abdelkawy, Naglaa Abdelmohsen, Mahmoud Abdelshakour, Ahmed Dahy, Norhan Gamal, Mohammed Gamal, Ahmad Hasan, Helal Hetta, Nehad Mousa, Mohamed Omar, Somia Rabie, Mahmoud Saad, Bakeer Saleh, Marwa Sayed Mohamed, Muhammad Shawqi (Assiut University Hospital); Heba Abdelhady Mousa, Mostafa Alnoury, Mohamed Elbealawy, Ahmed Elshafey, Muhammad Essam Ibrahim El Desouki Muhammad Ahmed, Mennatullah Ghonaim, Fawzy Hgag, Mohamed Ibrahim, Mahmoud Morsy, Mohamed Reda Loaloo, Ahmed Refaat, Hadeer Samir, Fatma Shahien, Mohamed Sobhy, Fathy Sroor (Banha University Hospital); Esraa Abdellatif, Marina Adel, Amr Abdelghani Afifi, Eman Afifi, Marco Antaky, Amr Dawoud, Naira El Zoghby, Amira El-remaily, Ali Abdelazez Elzanfaly, Ahmed Gadallah, Fatma Alzahraa Gamal, Omar Hashem, Shrouk Medhat Youssef, Aliaa Muhammad Attyah, Malak Munir, Omar Shazly, Esraa Taha, Karim Wilson (El Demerdash University Hospital); Sawsan Adel, Asmaa Ali, Esraa Eid, Esraa Elhelow, Marwa Elmahdy, Bassant Elshatby, Amany Hossam el-din Zakaria, Ahmad Hossny, Eman Ibrahim, Ahmed M.Yonis, Maram Metwalli, Basant Yousry, Esraa Zid (Gamal Abd El Nasser Hospital); Mina A Yacoub, Ahmed Abdelhakim, Nervana Abouelsoad, Mo'min Alkhatib, Ahmed Ashraf, Alaa Ashraf, Yasmin Elazab, Mahmoud Elfanty, Osama Elkabir, Mai Elsayed, Ahmed Elshimy, Hager Elsobky, John Eskander, Ahmed Gad, Ward Hamsho, Noura Khaled Abdelwahed, Menna Magdy, Dalia Moharam, Abeer Osama, Shereen Ramadan, Radwa Roum, Taqwa Sayed, Tarneem Shehada, Ahmed Mohy Zidan (Kasr Alainy Hospital, Faculty of Medicine, Cairo University); Khalid Abbas, Amr Ali, Mohamed Attia, Mohamed Balata, Ayman El Nakeeb, Mohamed Ibrahim Elsayed Elewaily, Ahmed Elfallal, Hossam Elfeki, Ahmed Elkhadragey, Sameh Emile, Helmy Ezzat, Hasnaa Hosni, Islam Mansour, Waleed Omar, Gehad Othman, Kareem Sadek, Mostafa Shalaby, Noura Shehab-Eldeen (Mansoura University Hospital); Rawda Anas khalifa, Helmy Badr, Mostafa Eldeep, Ahmed Eldeep, Amany Eldoseuky mohammed, Salwa Khallaf, Eman Magdy Hegazy, Rokia Mahmoud, Pola Mikhail, Mahmoud Morsi, Sara Mowafy, Dina Raafat, Amina Safy, Marwa Sera, Ahmed shible Sera (Menofiya University Hospital); Mostafa Salim Mohamed AbdAllah, Muhammad Abdelkader, Abdulrahman Osama Abdou, Ahmedgaber Ahmed, Shireen Gaafar, Fatma Ibrahim negm, Mina Lopic, Ahmed Maher, Hagar Mahmoud, Ahmed Mostafa, Mohamed Samir, Fatma Samy, Nourhan Sameda, Hind I. Shalaby (National Cancer Institute); Alaa El-taweel, Ahmed Galal Elnagar, Ahmed Gamal Hemidan, Mohamed Hussein, Ahmed.A. Kandil, Mf Moawad, Ayat Allah Nasser Hamamah, Mostafa Soliman (National Institute of Diabetes and Endocrinology Hospital); Mohamed Abdelkhalek, Noura Abdelmaksoud Tawakel, Ahmed Mohamed Abdelwahed, Alrawy Abdou, Khalid Atallah, Mohammed Yasser Elsherbeny, Eman Emara, Mohamed Hamdy, Omar Hamdy, Amira Haron, Salma Ismail, Islam Hany Metwally, Nihal Mohamed Hamed Elgaml, Ahmed Nassar, Basel Refky, Mirna Sadek, Mahmoud Saleh, Asmaa Yunes, Mai Zakaria, Mohammed Zuhdy (Oncology Center Mansoura University); Notila Fayed, Mohammed Mustafa Hassan Mohammed (Zagazig University Hospitals).

**Estonia:** Sander Kütner, Preet Melnik, Indrek Seire, Jyri Teras, Toomas Ümarik (The North Estonia Medical Centre).

**Finland:** Eppu Ainoa, Verner Eerola, Hanna Koppatz, Laura Koskenvuo, Ville Sallinen, Sini Takala (Helsinki University Hospital); Jevgeni Katunin, Aristotelis Kechagias, Arto Turunen (Kanta-Häme Central Hospital).

**France:** Niki Christou, Muriel Mathonnet (CHU Limoges); Vincent Lavoue, Krystel Nyangoh Timoh, Lucie Soulabaille (CHU Rennes - Breast Surgery); Romain Lesourd, Aude Merdrignac, Laurent Sulpice (CHU Rennes - General Surgery); Benoît André, Elodie Chantalat, Charlotte Vaysse (CHU Toulouse); Bertrand Dousset, Sebastien Gaujoux, Gregory Martin (Hôpital Cochin - APHP).

**Germany:** Octavian Clonda, Domantas Juodis, Klaus Kienle, Andras Mravik, Samuel Palmer, Gabor Szabadhegyi (Rottal-Inn-Kliniken).

**Ghana:** Anita Eseenam Agbeko, Solomon Gyabaah, Frank Enoch Gyamfi, Nuhu Naabo, Atta Owusu senior, Joseph Yorke (Komfo-Anokye Teaching Hospital); Frank Owusu (St. Patrick's Hospital); Francis Abantanga, Theophilus Teddy Kojo Anyomih, Abdul-Jalilu Mohammed Muntaka, Emmanuel Owusu Abem, Mohammed Sheriff, Stephen Tabiri, Paul M. Wondoh (Tamale Teaching Hospital).

**Greece:** Dimitrios Balalis\*, Dimitrios Korkolis (Agios Savvas Anticancer Hospital); Georgios Gkiokas, Eirini Pantiora\*, Theodosios Theodosopoulos (Aretaieion Hospital); Argyrios Ioannidis\*, Konstantinos Konstantinidis, Sofia Konstantinidou (Athens Medical Center); Nikolaos Machairas, Anna Paspala, Anastasia Prodromidou\* (Attikon University General Hospital); Christos Chouliaras, Konstantinos Papadopoulos\* (General Hospital of Nikaia); Ioannis Baloyiannis, Ioannis Mamaloudis, George Tzovaras\* (General University Hospital of Larissa); Ioanna Akrida, Maria-Ioanna Argentou, Stylianos Germanos, Evangelos Iliopoulos, Ioannis Maroulis, George Skroubis, George Theofanis (General University Hospital of Patras); Christos Chatzakis, Orestis Ioannidis\*, Lydia Loutzidou (George Papanikolaou General Hospital of Thessaloniki); Vasileios Kalles, Panagiotis Karathanasis, Nikolaos Michalopoulos, Charalampos Theodoropoulos, Dimitrios Theodorou, Tania Triantafyllou\* (Hippocratio General Hospital); Zoe Garoufalia, Natasha Hasemaki, Michalis Kontos, Gregory Kouraklis, Stylianos Kykalos, Theodore Liakakos, Eustratia Mpaili, Alexandros Papalampros, Dimitrios Schizas, Athanasios Syllaios, Ekaterini Christina Tampaki\*, Antonios Tsimpoukelis (Laiko University Hospital); Maria Ioanna Antonopoulou, Eirini Deskou, Dimitrios K. Manatakis\*, Dimitrios Papageorgiou, Menelaos Zoulamoglou (Naval And Veterans Hospital); Christos Anthoulakis, Michalis Margaritis, Nikolaos Nikoloudis\* (Serres General Hospital).

**Guatemala:** Veronica Campo, André Ceballos, Mario-Andrés Flores, Waleska Giron, Donghyun Ko, Gabriel Martinez, Gustavo Recinos\*, Verónica Rivera Lara, Nataly Rueda, Andres Sanchez, Jorge Carlos Guillermo Tejeda Garrido (Hospital General De Enfermedades); Maria-Lorena Aguilera-Arevalo, Alvaro Eduardo Alvarez Rivera, Elvis Benjamin Bamaca Ixcajoc, Lilian Elizabeth Barreda Zelaya, Patricia Chacòn-Herrera, Ligia Margarita Corea Ruiz, Guillermo Echeverria-Davila, Mario Garcia, Danilo García, Edgar Fernando Gutiérrez Mayen, Noriega José, Nery Mazariegos, Diego Méndez, Michael Paniagua Espinoza (Hospital General San Juan De Dios).

**Hungary:** Zsolt Baranyai, David Bardos, Marton Benke, Kristof Illes, Balint András Kokas, Réka Szabó (1st Department of Surgery - Semmelweis University).

**India:** Akhila Appukuttan, Anjitha Asok, Vijaykumar D.k (Amrita Institute of Medical Sciences Hospital); Kapil Malik, Praveen Ravishankaran, Ritesh Tapkire (Cachar Cancer Hospital and Research Centre); Guru Moorthy, Joyner Abraham, Ramesh Muthuvel (Government Rajaji Hospital); John Alapatt, Abhay Kattepur, Nizamudheen Pareekutty (Malabar Cancer Centre); Mebanshanbor Garod, Caleb Harris, Cliff Wanniang (North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS)); Ashish Gupta, Deepak Nehra, Sanjeev Parshad (Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences); Rajgopal Acharya, Rajendra Badwe, Manish Bhandare, Urvashi Jain, Karishma Kirti, Nita Nair, Shailesh Shrikhande, Purvi Thakkar (Tata Memorial Centre); Premkumar Anandan, Archana C S, Arun Holenarasipur Narasannaiah, Tejaswi Jagarlamudi, Sunil Kumar Venkatappa, Rashmi M R, Mallikarjuna Manangi, Abhishek Raghavendra, K. Seshagiri Rao, Vinay S, Vinay Sajjan, Aneesh Shenoy, Santhosh Shivashankar Chikkanayakanahalli, Kavya Tharanath, Sushmita V (Victoria Hospital).

**Indonesia:** Peter Adidharma, Raksheeth Agarwal, Radhian Amandito, Phebe Anggita Gultom, Ghafur Rasyid Arifin, Matthew Billy, Zatira Elfizri, Alessa Fahira, Devi Felicia, Triana Hardianti Gunardi\*, Nadya Johanna, Nadia Rahmadiani Nugrahadi, Sonar Soni Panigoro, Siti Rahmayanti, Retta Catherina Sihotang (Dr Cipto Mangunkusumo National General Hospital); Santi Yuanita Brata, Hadi Winoto (Mardi Rahayu Hospital).

**Iran, Islamic Rep.:** Nastaran Barati, Manoochehr Karami, Hamidreza Khorshidi, Homa Naderifar (Besat Hospital).

**Iraq:** Mazin A. Abdulla (Basra Teaching Hospital).

**Ireland:** Maggie Coleman, Ronan J Doherty, Rob Hannon (Beacon Hospital); Brenda Murphy, Aine Stakelum, Des Winter (St Vincent's University Hospital); Lylas Aljohmani, Richard Farnan, Yeshey Seldon, Tanna Tan, Shriya Varghese (St. James's Hospital); Mohammad Alherz, Muaaz Ather, Mohammad Bajilan, Vivien Graziadei, Isobel Pilkington, Omar Quidwai, Paul Ridgway, Haaris Shiwani\*, Abd al-Rahman Tahir (Tallaght Hospital); Eimear Blunnie, Daniel Burke, Niall Kennedy, Kate Macdonagh, Maeve O'Neill, Siobhan Rooney (University Hospital Galway).

**Italy:** Giuseppe Falco, Guglielmo Ferrari, Simone Mele, Gabriela Elisa Nita, Lara Ugoletti, Maurizio Zizzo (Arcispedale Santa Maria Nuova); Gianmaria Confalonieri, Giovanni Pesenti, Fulvio Tagliabue (ASST di Lecco - P.O di Lecco); Gianluca Baronio, Deborah Ongaro, Giacomo Pata (ASST Spedali Civili, Ospedale di Brescia); Bruno Compagnoni, Renato Salvadori, Lucio Taglietti (ASST Valcamonica Ospedale di Esine); Nicola D'Alessandro, Pierpaolo Di Lascio, Giovanni Pascale (Azienda Ospedaliera Regionale 'San Carlo'); Luca Bortolasi, Tommaso Campagnaro, Massimo Carlini, Giorgio Lisi, Davide Lombardi, Corrado Pedrazzani, Domenico Spoletini, Giulia Turri, Paola Violi (Azienda Ospedaliera Universitaria Integrata di Verona); Donato Francesco Altomare, Fabrizio Aquilino, Nicola Musa, Vincenzo Papagni, Arcangelo Picciariello, Leonardo Vincenti (Azienda Ospedaliero Universitaria Consorziale Policlinico Di Bari); Dario Andreotti, Savino Occhionorelli, Matteo Tondo (Azienda Ospedaliero-Universitaria Di Ferrara); Stefano Maria Massimiliano. Basso (Azienda Per L'assistenza Sanitaria N. 5 Friuli Occidentale); Riccardo Cirelli, Marco Enrico Mario Maino, Guglielmo Niccolò Piozzi (Casa di Cura Igea); Emanuele Picone, Rosa Scaramuzzo, Giovanni Sinibaldi (Fatebenefratelli Isola Tiberina); Alfonso Amendola, Lorenzo Anastasio, Luigi Bucci, Emanuele Caruso, Antonio Castaldi, Sara Di Maso, Vincenza Paola Dinuzzi, Giovanni Esposito, Maria Gaudiello, Mariano Cesare Giglio, Paola Antonella Greco, Gaetano Luglio, Andrea Manfreda, Ester Marra, Federica Mastella, Gianluca Pagano, Roberto Peltrini, Vincenzo Pepe, Michele Sacco, Viviana Sollazzo, Giovanni Spiezio (Federico II University of Naples); Ettore Cianchetti, Nunzia Menduni (Hospital G.Bernabeo); Michele Maria Carvello, Francesca Di Candido, Antonino Spinelli (Humanitas Research Hospital); Fabio Corsi, Luca Sorrentino (ICS Maugeri); Fabio Marino (IRCCS 'Saverio de Bellis'); Emanuele Luigi Giuseppe Asti, Luigi Bonavina, Emanuele Rausa (IRCCS Policlinico San Donato); Martina Asta, Andrea Belli, Francesco Bianco, Carmela Cervone, Paolo Delrio, Armando Falato, Andrea Fares Bucci, Rita Guarino, Ugo Pace, Daniela Rega (Istituto Nazionale Tumori Fondazione, Pascale-I.R.C.C.S.); Emilia De Luca, Gaetano Gallo, Giuseppe Sammarco, Giuseppe Sena, Giuseppina Vescio (Mater Domini University Hospital); Letizia Santandrea, Giampaolo Ugolini, Davide Zattoni (Ospedale degli Infermi di Faenza); Nicola Chetta, Gaetano Logrieco, Serafino Vanella (Ospedale Generale Regionale F. Miulli); Gianluca Garulli, Nicola Zanini (Ospedale Infermi di Rimini); Andrea Bondurri, Francesco Cammarata, Francesco Colombo, Diego Foschi, Giulia Maria Beatrice Lamperti, Anna Maffioli, Gianluca Matteo Sampietro, Al'ona Yakushkina, Gloria Zaffaroni (Ospedale Luigi Sacco Milano); Luca Ansaloni, Enrico Cicuttin, Maria Grazia Sibilla (Ospedale M. Bufalini); Harmony Impellizzeri, Marco Inama, Gianluigi Moretto (Ospedale Pederzoli); Sylvie Mochet, Elisa Ponte, Antonella Usai (Ospedale Regionale Umberto Parini); Stefano Mancini, Andrea Sagnotta, Luigi Solinas (Ospedale San Filippo Neri); Elisa Bolzonaro, Nicolò Tamini (Ospedale San Gerardo); Gianluca Curletti, Raffaele Galleano, Michele Malerba (Ospedale Santa Corona, Pietra Ligure (SV)); Sofia Campanella, Gianfranco Cocorullo, Francesco Colli, Paolino De Marco, Nicolò Falco, Tommaso Fontana, Leonel jospin Kamdem Mambou, Antonella La Brocca, Leo Licari, Brenda Randisi, Giovanna Rizzo, Giulia Rotolo, Giuseppe Salamone, Roberta Tutino, Paolina Venturelli (Policlinico Paolo Giaccone di Palermo); Stefano Malabarba, Alessandro Sgrò, Ivan Vella (Policlinico San Matteo); Bruno Cirillo, Daniele Crocetti, Giorgio De Toma, Pierfrancesco Lapolla, Andrea Mingoli, Paolo Sapienza (Policlinico Umberto I); Angela Belvedere, Stefania Bianchini, Margherita Binetti, Arianna Birindelli, Valeria Tonini (S.Orsola-Malpighi Hospital); Mauro Podda, Fabio Pulighe (San Francesco Hospital); Michele De Rosa (San Giovanni Battista Hospital); Lorenzo Bono, Felice Borghi, Paolo Geretto, Maria Carmela Giuffrida, Corrado Lauro, Alessandra Marano, Luca Pellegrino, Paola Salusso, Diego Sasia (Santa Croce and Carle Hospital); Michela Campanelli, Alberto

Realis Luc, Mario Trompetto (Santa Rita Clinic, Vercelli); Roberto Cardia, Nicola Cillara, Antonio Nicola Giordano (Santissima Trinità - ATS Sardegna); Antonio Costanzo, Mario Alessandro Giovilli, Luca Turati (Treviglio Hospital); Silvestro Canonico, Gianluca Pellino, Guido Sciaudone, Francesco Selvaggi, Lucio Selvaggi (Università della Campania 'Luigi Vanvitelli', Naples).

**Jordan:** Nader Albsoul, Ahmad AlBsoul, Ala'a Aldeen Alkhatib, Osama Alsallaq, Justin Z. Amarin, Rami Ayoub, Isam Bsisu\*, M S El Muhtaseb, Mohammad Jabaiti, Jamal Melhem, Ibrahim Nour, Yasmeeen Z. Qwaider, Mohammad Hasan Salameh, Ahmad Suleihat, Haya H. Suradi (Jordan University Hospital); Mohammad Alammari, Almoutuz Aljaafreh, Mohammad Bani hani\*, Zeina Bani hani, Farah Bani Hani, Toqa Fahmawee, Shadi Hamouri, Cyrine Katanani, Ra'fat Tawalbeh, Tamara Tawalbeh, Hassan Zawahrah (King Abdullah University Hospital); Mohamad K. Abou Chaar, Lana Abusalem, Mahmoud Al-Masri\*, Hani Al-Najjar, Lutfi Barghuthi (King Hussein Cancer Center).

**Kenya:** Zahra Ahmed, Adnan Maulana, Omar Ngotho (Coast Provincial General Hospital); Charbel Kamau, Aruyaru Stanley Mwenda (Consolata Hospital); Fridah Bosire, Elizabeth Mwachiro, Robert Parker, Ian Simel, Kimutai Sylvester (Tenwek Hospital).

**Libya:** Abdulmunem Ahmed Mustafa Althini, Sofian Elbarouni, Aya Elseed Elbeshina, Ahmed Gwea, Ans Malek, Wedad Albashir Masoud Farag (Alkhadra Hospital); Abdulwahab Abdalei, Abu Baker Abdel Malik\*, Areej Abo-khammash, Ma'aly Abuhlaiga, Nour Adnan, Marwa Albaggar, Asma Alfitory, Asma Aljanfi, Fakhruddin Almuzghi, Zohoor Altumei, Fatima Alzabti, Hana Ashoushan, Mohamed Assalhi, Joma Azzubia, Sondos Bnhameida, Malik Delhen, Houssein Elshafei, Hana Elteir, Fatima Esbaga, Abdel Aziz Gobbi, Fatma Hamouda, Hamdan Hilan, Rania Ismail, Fieruz Jebran, Muataz Kasbour, Galia Maderi, Saja Mohammad, Burooj Mohammed, Habib Murtadi, Hamassat Mustafa, Mohamed Rajab, Sarah Trenba, Mariam Wafaa (Misurata Cancer Center); Eman Al Sagheir, Alabas Almigheerbi, Ahmed Alzahaf, Sumayyah Ghayth Bahroun\*, Najah Ben Dallah, Mahmoud Elshaibani, Haitem Esweay, Maha Karar, Samah Omar, Eman Younes, Maha Younes, Dafer Zreeg (National cancer institute); Saleh Abujamra, Firas Ashour, Mala Elgammudi, Wesal Omar F. Aljadidi, Enas Saddouh, Randa Sharif (New Bridge Hospital); Aya Alabuzidi, AbdulMawlay Alwerfally, Sarra Aribi, Fatma Bibas, Taha Elfaituri, Yasmine Elhajjaji, Ala Khaled, Wegdan Khalil, Tesneem Layas, Enas Soula, Ahmed Tarek (Tripoli Central Hospital); Muad fathi khalleefah Abu hallalah, Saleh Abujamra, Hazem Abdelkarem Ahmed\*, Tagwa Alsharef, Abdulsalam Ali Ben Saoud, Tasnim El Gharmoul, Ahmed Elhadi, Safa Elrais, Abdulhalim Shebani, Heba Zarti, Asaid Zeiton (Tripoli Medical Center).

**Lithuania:** Marijus Ambrazevicius\*, Nerijus Kaselis, Migle Stakyte (Klaipeda Republic Hospital); Oleg Aliosin, Agne Cizauskaite, Sarunas Dailidenas, Vitalijus Eismontas, Migle Kybrasiene, Vitalija Nutautiene, Narimantas Samalavicius, Dainius Simcikis\*, Algirdas Slepavicius, Albinas Tamosiunas, Nerijus Ubartas, Paulius Zeromskas (Klaipeda University Hospital); Saulius Bradulskis, Edvinas Dainius, Juozas Juočas, Egle Kubiliute, Juozas Kutkevičius, Aurimas Opolskis, Audrius Parseliunas, Andrejus Subocius, Donatas Venskutonis, Egle Virbickaite, Diana Zuikyte (Lithuanian University of Health Sciences Kaunas Clinical Hospital); Algirdas Bogusevicius, Kristina Buzaitė, Daiva Čepulienė, Ieva Cesleviciene, Vaidotas Cesna, Jolanta Gribaускаite, Povilas Ignatavicius, Mantas Jokubauskas, Monika Liugailaitė, Ernest Margelis, Ruta Mazelyte, Lina Pankratjevaitė, Matas Pažusis, Agne Rackeviciute, Justina Saladyte, Monika Škimelytė, Vygintas Šlenfuktas, Monika Sudeikyte, Algimantas Tamelis, Tomas Vanagas\*, Žygmantas Žumbakys (Lithuanian University of Health Sciences Kaunas Clinics); Aivaras Atkociunas, Audrius Dulskas, Justas Kuliavas (National Cancer Institute); Justas Birutis\*, Sigitas Paškevičius, Mindaugas Šatkauskas (Republican Siauliai County Hospital); Donatas Danys, Matas Jakubauskas, Lina Jakubauskiene, Marius Kryzauskas, Vytautas Lipnickas, Gabija Makūnaitė (Vilnius University Hospital).

**Madagascar:** Fanjandriny Rasoaherinomenjanahary, Herizo Rasolofonarivo, Luc Hervé Samison\* (Joseph Ravoahangy Andrianavalona Hospital).

**Malawi:** Bitiel Banda, Precious Malemia, Vanessa Msosa (Kamuzu Central Hospital).

**Malaysia:** Ahmad Imran Ahmad Izzuddin, Andre Das (Hospital Kajang); Ying Yee Gan, Tan Shong Sheng, Jia yng Siaw (Hospital Sibui); Mohd Fadliyazid Ab Rahim, Dyg Zahratul Hamrak Abang Jamari, Nurfariza Che Husin, Muhd Yusairi Kamarulzaman, Yi Ping Lim, Nil Amri Mohamed Kamil, Mohd Razeen Mohd Hassan, Saidah Mohd Sahid\*, Johari Mustafa, Elaine Hui Been Ng, Wan Khamizar Wan Khazim (Hospital Sultanah Bahiyah); Ng Chang Ern, P.g. Lingshan, Syariz Ezuan Sulaiman (Hospital Sultanah Nora Ismail); Sue Ean Ang, Muhammad Navid Bin Mohamad Sithik, Yih Jeng Cheong, Mahadevan Deva Tata, Law Jia Xian, Aravinthan Kadravello, I-Ern Koh, Li-Yen Ng, Yuki Julius Ng We Yong, Kandasami Palayan, Chi Xuan Sam, Phuah Siow Jin, Jeremy Tan Ern Hwei, Yita Tang, Alvin Zubin Ter (Hospital Tuanku Ja'afar); Michael Pak-Kai Wong, Andee Dzulkarnaen Zakaria, Zaidi Zakaria (Hospital Universiti Sains Malaysia); Fitzjerald Henry, Thyivya Kalaiselvan (Selayang Hospital); Muhammad Fairuz Shah Abd Karim, Mohamed Rezal Abdul Aziz, Nora Abdul Aziz, Tak Loon Khong, Peng Choong Lau, Hiong Chin Lim, April Camilla Roslani\*, Jonathan Chen Ken Seak, Sui-Weng Wong, Lai Fen Wong, Leow Yeen Chin (University Malaya Medical Centre).

**Malta:** Mercy Chinemerem Anyanwu, Elaine Borg, Zachary Busuttil, Thomas Calleja, Kurt Lee Chircop, Ruth Cutajar, Andrew Michael Dimech, Sarah Ellul, Joseph Galea, Kiara Gascon Perai, Ruth Gatt, Lisa Kelman, Elizabeth Micallef, Favour Nwolu, Kim Sammut, Joanna Thompson, Sean Warwicker, Matthew Zammit (Mater Dei Hospital).

**Mexico:** Fernando Cordera, Efraín Cruz González, Jorge Sánchez-García (ABC Medical Center); Francisco José Barbosa Camacho, Francisco Javier Barrera López, Carlos Jose Zuloaga Fernandez del Valle (ANKER Oncologia Global Especializada); Eric Acosta, Iván Romarico González Espinoza, Perla Moreno (Hospital Angeles Puebla); Ana Olivia Cortes-Flores, Clotilde Fuentes Orozco, Alejandro Gonzalez Ojeda (Hospital de Especialidades, CMNO-IMSS); Samantha Corro Díaz González, Laura Martinez, Antonio Ramos-De la Medina (Hospital Español Veracruz); Bonifacio Mosqueda Amador, Armando Novoa, Dennet Arturo Olazo Espejo (Hospital Regional de Alta Especialidad); Alejandro Jimenez, Federico Lopez Rosales, Elva Gabriela Vanoye (Hospital Regional de Alta Especialidad de la Península de Yucatán); Luis Alberto Garcia Gonzalez, Roberto Carlos Miranda-Ackerman, Manuel Solano-Genesta (Hospital San Javier); Alethia Alvarez-Cano, Hector Hugo Romero-Garza (Hospital Universitario Dr José Eleuterio González); Heriberto Medina-Franco, Lorelí Mejía-Fernández, Noel Salgado-Nesme, Omar Vergara-Fernandez (Instituto Nacional de Ciencias Médicas y Nutrición 'Salvador Zubirán'); Guadalupe Montserrat Gutiérrez-Mota, Francisco Xavier Hernandez Vera, Anabella Llantada Lopez, Gilberto Morgan Villela, Felipe de Jesus Ramirez Padilla, Walezka Tapia Marin (Morgan Oncología Soluciones Integrales); Mónica Martínez Maldonado, Ramses Sánchez Suárez, José Manuel Troche (Unidad de Medicina de Alta Especialidad 'Adolfo Ruiz Cortines').

**Morocco:** Chaymae Benyaiche, Oumaima Outani (Centre Hospitalier Universitaire Ibn Sina Rabat); Souadka Amine, Amine Benkabbou, Anass Mohammed Majbar, Raouf Mohsine, Ali Rafik (Institut National d'Oncologie).

**Myanmar:** Thida Oung, Moe Moe Tin (North Okkalapa General Hospital).

**Namibia:** David W Borowski, Philipp Plarre (Mediclinic Cottage Hospital); David W Borowski, Philipp Plarre (Welwitschia Hospital).

**Netherlands:** Anna Alberga, Nina Sluiter, Jurriaan Tuijnman (Amsterdam UMC VUmc); Robin Blok, Didem Cömert, Roel Hompes, Marianne Kalf, Merel Elisabeth Stellingwerf, Pieter Tanis, Mark van Berge Henegouwen, Elise Maria van Praag, Daan Wisselink (Amsterdam UMC, University of Amsterdam); Michael Gerhards, Josephine Lopes Cardozo, Emma Westerduin (Onze Lieve Vrouwe Gasthuis); Joske de Jonge, Aaw van Geloven, Kaz van Schilt (Tergooi Hospital); Frank den Boer, Simone Stoots, Stijn Vlek (Zaans Medisch Centrum).

**New Zealand:** Jamie Adams, Ibrahim S. Al-Busaidi, Gabrielle Budd, Seung il Choi, Michael Jen Jie Chu, Anurag Ganugapati, Lucy McKinstry, Rebecca Pascoe, Simon Richards, Kenrick Rosser, Annie Stevenson, Rebecca White (Christchurch Hospital); Shebani Farik, Jin Kwun, Ahmed Murad (North Shore Hospital); Sarah Cowan, Timothy Hall, Michael Hayton (Taranaki Base Hospital).

**Niger:** Laminou Malam Sani (Agadez Hospital); Souleymane Oumarou Garba\* (Zinder Mother Child Center); Harissou Adamou, Ibrahim Amadou Magagi\*, Oumarou Habou (Zinder National Hospital).

**Nigeria:** Halima Aliyu, Muhammad Daniyan, Tunde T. Sholadoye (Ahmadu Bello University Teaching Hospital); Lawal Abdullahi, Lofty-John Anyanwu\*, Aminu Mohammad Mohammad, Abubakar Bala Muhammad, Abdurrahman Abba Sheshe, Ibrahim Suleiman (Aminu Kano Teaching Hospital); Alaba Adesina, Ajibola Awolowo, Clement Onuoha, Omotayo Salami, Ogechukwu Taiwo\*, Agboola Taiwo (Babcock University Teaching Hospital); Stephen Kache, Jerry Godfrey Makama, Danjuma Sale (Barau Dikko Teaching Hospital); Olajide Abiola, Akinlabi Ajao, Anthony Ajiboye (Bowen University Teaching Hospital); Amarachukwu Etonyeaku, Julius Olaogun\* (Ekiti State University Teaching Hospital); Ademola Adebajo, Opeoluwa Adesanya (Federal Medical Centre); Michael Olatunji Afolayan, Olanrewaju Balogun, Ayomide Makanjuola, Samuel Nwokocha, Rufus Wale Ojewola, Thomas Olagboyega Olajide\* (Lagos University Teaching Hospital); Adewale Aderounmu, Abdul-Rashid Adesunkanmi, Adewale Adisa\*, Augustine Agbakwuru, Adeleke Akeem Aderogba, Olusegun Isaac Alatise, Olukayode Arowolo, Oladejo Lawal, Tajudeen Mohammed, Chinedu Ndegbu, Olalekan Olasehinde, Funmilola Wuraola (Obafemi Awolowo University Teaching Hospitals Complex); Akinbolaji Akinkuolie, Amarachukwu Etonyeaku, Arinzechukwu Mosanya (Obafemi Awolowo University Teaching Hospitals Complex Wesley Guild Hospital Unit); Omobolaji Ayandipo, Peter Elemile, Taiwo Akeem Lawal (University College Hospital); Samuel Ali SANI, Stephen Garba, Rebecca Hauwa SANI, Samson Olori\*, Henry Onyebuashi, Ifeanyi Umoke (University of Abuja Teaching Hospital); Adedire Adenuga, Ademola Adeyeye\*, Olufemi Habeeb, Bashir Lawal, Abdulrasheed Nasir (University of Ilorin Teaching Hospital).

**Norway:** Eirik Kjus Aahlin, Didrik Kjørnås, Elisabeth Myrseth (University Hospital Of North Norway).

**Pakistan:** Jibran Abbasy, Abdul Alvi, Omair Saleem (Aga Khan University); Asma Afzal, Anam Nazir (Ganga Ram Hospital); Muhammad Farooq, Ayesha Liaqat, Syed Asghar Naqi\*, Ali Raza, Muzna Sarfraz, Muhammad Sarwar (King Edward Medical University, Mayo Hospital, Lahore); Muntaha Banglani, Ambreen Munir, Rahmat Sehrish (Liaquat University of Medical & Health Sciences); Bushra Ayub, Raza Sayyed (Patel Hospital); Amna Altaf, Saima Ayub, Ahmad Uzair Qureshi, Komal Saeed, Bilal Syed (Services Hospital Lahore); Sana Amir Akbar, Abdul Wahid Anwer, Ruqayya Naheed Khan\*, Amina Iqbal Khan, Shahid Khattak, Sameen Mohtasham, Muhammad Asad Parvaiz, Aamir Ali Syed (Shaukat Khanam Memorial Cancer Hospital and Research Centre); Abdul Basit Ansari, Noman Shahzad (Sindh Institute of Urology and Transplantation); Tanwir Khaliq, Isbah Rashid, Shahzad Hussain Waqar (The Pakistan Institute of Medical Sciences).

**Palestine:** Hasan Abu Al-saleem, Amjad Abu Alqumboz, Mohammad Alqadi, Adham Amro, Rawan Assa, Eman Awesat, Rawan Ayyad, Mohammed Hammad, Ayat Haymony, Bassel Hijazi, Bara Hmeidat, Rowaa Lahaseh, Aseel Qawasmi, Alaa Rajabi, Mohammed Shehada, Sundus Shkokani, Yasmine Yaghi, Nadine Yaghi (Al Makassed Islamic Charitable Society Hospital Jerusalem); Mohammad AlZohour, Mohammad Farid, Yousef Mahmoud Habes, Wesam Juba, Yanal Nubani, Abdelrahman Rabee, Mohammad Sa'deh (Al-Ahli Hospital); Saeed Abed, Iyad Al basos, Mohammad Alswerki, Dina Ashour, Israa Awad, Samar Diab, Alaa El Jamassi, Sahar El-Kahlout, Somaya Elhout, Ahmed N K Hajjaj, Doaa Hasanain, Baraa Nabil hajjaj, Mohammed Obaid, Eman Saikaly, Ahmed Salhi (Al-Shifa Hospital); Hiba Al-Tammam, Murad Almasri, Muath Baniowda, Doha Beshtawi, Ali Horoub, Rami Misk, Bayan Mohammad, Rami Qasrawi, Tasnim Sholi (An-Najah National University Hospital); Samar Abu-Nimeh, Abrar Abu-srou, Sadi A. Abukhalaf, Samer Adawi, Barah Alsalameh, Kholoud Ayesh, Muawiyah Elqadi, Ahmad Hammouri, Fatima Karim Mustafa, Natalie Marzouqa, Shatha Melhem, Dima Miqdad, Balqees Mohamad, Mhammed Rawhi (Beit Jala Governmental Hospital (Al Hussein)); Ayman B. Abu Ahammala, Ahmed Abu Ataya, Israa Abu Jayyab, Samar Al-Shwaikh, Othman Alagha, Mohammed Alasttal, Haneen Awadallah, Mahmood Elblbessy, Jihad Fares, Akram Jarbou, Ibtisam Mahfouz, Moath A. Albahnasawi (European Gaza Hospital); Asmaa' Abo mahadi, Hasan Abuelhatal, Ayham Abuelqomboz, Abdelrahman Almoqayyad, Abdallah Alwali, Reem Balaawi, Mahmoud Hamouda,



Mohammed Humeid, Abdullah Jedyan, Tasneem Mahmoud Abu hamam, Ghadeer Matar, ALi Salem, Tahani Samra, Nureddin Shaheen, Karam Shihada (Indonesian Hospital); Ayoob A.Nemer, Mahmoud Abu Al Amrain, Abdulwhhab Abu Alamrain, Najlaa Abu Jamie, Mohammed R. Abu-Rous, Nada Alfarrar, Mohammed AlTaweel, Noor Alwhaidi, Ramadan Hamed, Bader Saqqa, Ahmad Shaheen (Nasser Hospital); Dana Aljaber, Loay Aljaberi, Malak Alwaheidi, Assef Jawaada, Hani Khaldi, Rami Qahoush, Jalil Qari, Rana Saadeh, Ahlam Salim, Aseel Yacoub (Palestine Medical Complex); Abbas Abbas, Rana Abu shua'ib, Baraa Abu Zainah, Mahmoud AbuSirrees, Basheer Babaa, Ola Barhoush, Asef Belal qadomi, Laith Daraghme, Reema Haji, Alaa Khatatbeh, Lana Khatib, Salsabeel Qarariah, Yara Quzmar, Khalil Safadi, Roqaya Salameh (Rafidia Hospital); Mohammad Hassan, Shifaa Herzallah, Loai Massad, Ahmed Nazzal, Ranin Nazzal (The Martyr Dr. Khalil Sulaiman Hospital (Jenin Governmental Hospital)).

**Paraguay:** Dennis Escobar, Gustavo Miguel Machain V, Agustin Rodriguez Gonzalez (Hospital de Clínicas, II Cátedra de Clínica Quirúrgica, Universidad Nacional de Asunción).

**Peru:** Jorge Emerson Chachaima Mar, Nathaly Olga Chinchihualpa Paredes, Vicente Cuba, Walter Lopez, Maria Milagros Niquen Jimenez\*, Nestor Alberto Sanchez Bartra, Olenka Sapallanay Ojeda, Diego Sequeiros, Andrea Toscano Pacheco, María Vergara (Arzobispo Loayza National Hospital); Sol Abarca, Rodrigo Alcorta, Giuliano Borda-Luque, Ivan Edward Eusebio Zegarra, Claudia Luján López, Mirella Marrufo, Cinthya Mogrovejo, Andrea Nomura, Yamile Rodríguez Angeles, Maitza Rosario Vidal Meza, Gabriela Zavala\* (Cayetano Heredia National Hospital); José Neiser Castillo Arrascue, Jomara Caroline Hidrogo Cabrera, José Julio Mariano Larrea vera, Miguel Osorio, Edgar Alcides Ylatoma Díaz\* (Hospital Nacional Almanzor Aguinaga Asenjo).

**Philippines:** Mark Anthony Fontanilla, Joseph Roy Fuentes, Anna Leah Salazar (José R. Reyes Memorial Medical Center); Genieve Dominguez, Marc Paul Lopez, Shiela Macalindong, Mark Augustine Onglao, Arjel Ramirez, Marie Dione Sacdalan, Mayou Martin Tampo, Gemma Leonora Uy (Philippine General Hospital, University Of The Philippines Manila); Jeremiah Mangahas, Kenneth Yabut (Quirino Memorial Medical Center); Joannes Paul Cañete, Bernalynn Eris Cansana, Ernes John Castro, Maria Kaiserin Lipana, Manuel Francisco Roxas, Vlu Jean Zara (The Medical City).

**Poland:** Maciej Chroł, Paula Franczak, Michał Orłowski (Ceynowa Hospital); Piotr Budzyński, Andrzej Budzyński, Pawel Bury, Agata Czerwińska, Jadwiga Dworak, Jacek Dziedzic, Michał Kisielewski, Jan Kulawik, Anna Lasek, Piotr Major, Piotr Małczak, Marcin Migaczewski, Michał Pędziwiatr, Magdalena Pisarska, Dorota Radkowiak, Mateusz Rubinkiewicz\*, Anna Rzepa, Tomasz Skoczylas, Maciej Stanek, Katarzyna Truskiewicz, Mateusz Wierdak, Marek Winiarski, Piotr Zarzycki, Anna Zub-Pokrowiecka (Jagiellonian University Medical College); Piotr Kowalewski, Rafał Roszkowski, Maciej Walędziak (Military Institute Of Medicine).

**Portugal:** Miguel Tomé, Sara Patrocinio, Ines Guerreiro\* (Centro Hospitalar Barreiro Montijo, EPE); Filipe Almeida, Xavier de Sousa\*, Nuno Monteiro (Centro Hospitalar de Setúbal); Maria Teresa Costa Santos\*, Daniela de Oliveira, Marta Lopes Serra, Daniela Morgado, Christian Neves, Ana Carolina Oliveira, Alice Pimentel, Sofia Silva (Centro Hospitalar do Baixo Vouga); Márcia Carvalho\* (Centro Hospitalar do Medio Ave); Lúcia Carvalho, Joana Magalhães, Leonor Matos\* (Centro Hospitalar Entre o Douro e Vouga); Tânia Monteiro, Carlota Ramos\*, Vanessa Santos (Centro Hospitalar Lisboa Norte); José Barbosa, Jose Costa-Maia, Vítor Devezas, Ana Fareleira, Cristina Fernandes, Diana Gonçalves, Henrique Mora, Marina Morais\*, Fabiana Silva de Sousa (Centro Hospitalar Sao Joao); Sara Catarino Santos\*, Ana Logrado, André Tojal (Centro Hospitalar Tondela-Viseu); Edgar Amorim, Miguel F. Cunha\*, Ana Fazenda, João Pedro Melo Neves, Inês Isabel Sampaio da Nóvoa Gomes Miguel, Diogo Veiga (Centro Hospitalar Universitario do Algarve); José Azevedo, Hugo Cardoso Louro\*, Mariana Leite (Centro Hospitalar Vila Nova de Gaia/Espinho); José Azevedo\*, Maria Bairos Menezes, Bárbara Gama (Hospital da Horta, E.P.E.); Diana Brito, Marta Cristina Cruz Martins, André Graça e Magalhães, Ana Catarina Longras\*, Rita Lourenço, Diana Matos (Hospital da Senhora da Oliveira); Luis Castro, Filipa Policarpo, Joana Romano\* (Hospital de Egas Moniz); Mariana Leite, Cristina Monteiro\*, Diogo Pinto (Hospital de Santa Luzia); Marina Duarte, Sónia Fortuna Martins\*, Mariline Oliveira

(Hospital de Santarem); Diogo Galvão, Lisandra Martins, Anaisa Silva, Viorel Taranu, Bárbara Vieira\* (Hospital de Santo Espírito da ilha Terceira); Jessica Neves\*, Simone Oliveira, Hugo Ribeiro (Hospital Distrital da Figueira da Foz); Margarida Cinza, Rosa Felix, Arnaldo Machado, Joana Oliveira, Joana Patrício\*, Rita Pedrosa de Lima, Mário Pereira, Miguel Rocha Melo, Cristina Velez (Hospital do Espírito Santo); Alberto Abreu da Silva, Mariana Claro\*, Daniel Costa Santos, Andreia Ferreira (Hospital do Litoral Alentejano); Hugo Capote, Daniela Rosado, Filipa Taré (Hospital Doutor José Maria Grande); Oriana Nogueira, Miguel Ângelo, José Miguel Baiao, Andreia Guimarães, João Marques, Miguel Nico Albano\*, Marta Silva, Ana Valente da Costa, Teresa Vieira Carço (Hospital Geral - Centro Hospitalar de Coimbra); Sara Almeida Braga, Ines Capunge, Marta Fragoso\*, João Guimarães, Bruno Pinto, João Ribeiro (Hospital Prof. Doutor Fernando Fonseca, E.P.E.); Miguel Angel, Guilherme Fialho\*, Monica Guerrero (Hospital Santa Luzia Elvas); Filipa Campos Costa, Diogo Cardoso, Vasco Cardoso (Hospital Sao Francisco Xavier); Magda Alves, Inês Estalagem, Tiago Louro, Cláudia Marques\*, Rita Martelo, Miguel Morgado (Hospital Vila Franca de Xira); Rita Canotilho, Ana Margarida Correia, Pedro Martins, Mariana Peyroteo\* (IPO Porto); João Gomes, Rita Monteiro, Manuela Romano\* (Unidade Local de Saúde de Castelo Branco); Daniela Macedo Alves, Rita Peixoto, Catarina Quintela\* (Unidade Local de Saude de Matosinhos - Hospital Pedro Hispano); Maria João Jervis, Débora Melo, André Pacheco, Valter Paixão, Vera Pedro, Joana Pimenta, João Pimenta de Castro\*, Ana Rocha (Unidade Local de Saude do Baixo Alentejo).

**Romania:** Mircea Beuran, Matei Razvan Bratu, Cezar Ciubotaru, Bogdan Diaconescu, Sorin Hostiuc, Ionut Negoii, Bogdan Stoica, NA (Emergency Clinical Hospital Bucharest).

**Russian Federation:** Evgeny Anokhin, Georgy Kuznetsov, Giorgi Oganezov, Fedor Paramzin, Ekaterina Romanova, Valeryan Rutkovskii, Vasilii Rutkovskii, Mikhail Shushval, Mikhail Zabiya (Kaliningrad Regional Hospital); Khasan Dzhumabaev, Valerii Ivanov, Zaman Mamedli (N.N.Blokhin Russian Cancer Research Center); Sergey Achkasov, Artem Balkarov, Elnur Nabiev, Marat Nagudov, Evgeny Rybakov, Karina Saifutdinova, Oleg Sushkov, Armen Vardanyan\* (State Scientific Centre of Coloproctology).

**Rwanda:** Ainhoa Costas-Chavarri, Lule Joseph, Isaac Ndayishimiye (Rwanda Military Hospital); Jc Allen Ingabire, Ntirenganya Faustin, Alphonse Zeta Mutabazi, Jean Paul Mvukiyehé, Vizir J.P Nsengimana, Carine Uwakunda (University Teaching Hospital of Kigali).

**Saudi Arabia:** Mohammad Monir Abbas, Nouf Akeel, Murad Aljiffry, Kholoud Awaji, Ali Farsi, Ghader Jamjoum, Ahmad Khoja, Ashraf Maghrabi, Nadim Malibary, Mohammed Nassif, Abdulaziz Saleem, Abdullah Sultan, Wail Tashkandi, Hanaa Tashkandi, Nora Trabulsi (King Abdulaziz University Hospital).

**Senegal:** Mouhamadou Bachir Ba, Adja Coumba Diallo, Abdourahmane Ndong (Hopital Aristide Le Dantec).

**Serbia:** Vladica Cuk, Uroš Janković, Jovan Juloski (Zvezdara University Medical Center).

**Singapore:** Sharon Zhiling Koh, Frederick Koh, Kuok Chung Lee, Kai Yin Lee, Sean Lee, Wei Qi Leong, Bettina Lieske, Su Ann Lui, Prajwala Prakash (National University Hospital).

**Slovenia:** Jan Grosek, Gregor Norcic, Ales Tomazic (University Medical Centre).

**South Africa:** Nicolas Fitchat, Robert Jaich, Devorah Wineberg (Chris Hani Baragwanath Academic Hospital); Modise Zacharia Koto (Dr George Mukhari Academic Hospital); Daniella Baiocchi, Damian Clarke, Christina Johanna Steenkamp, Stephanie Van Straten (Greys hospital); Sharon Bannister, Adam Boutall, Galya Chinnery, Anna Coccia, Angela Dell, Parveen Karjiker, Christo Kloppers, Nicholas Loxton, Tumi Mabogoane, Francois Malherbe, Eugenio Panieri, Shreya Rayamajhi, Richard Spence, Tirsia van Wyngaard, Claire Warden (Groote Schuur Hospital); T E Madiba, Yoshan Moodley, Nivashen Pillay\* (Inkosi Albert Luthuli Central Hospital); Savannah Brooks, Charlise Kruger, Lisa Hannah Van Der Merwe (Kalafong Academic Hospital); Ferhana Gool, Maahir Kariem

(Mitchell's Plain District Hospital); Heather Bougard, Kathryn Chu, Nazmie Kariem, Fazlin Noor, Reantha Pillay, Leandi Steynfaardt (New Somerset Hospital).

**Spain:** Lucía González González, José Miguel Marín Santos, Paula Martín-Borregón, Javier Martínez Caballero, Cristina Nevado García, Pastora Rodríguez Fraga (12 de Octubre University Hospital); Gonzalo De Castro Parga, Maria Pilar Fernández Veiga, Lucía Garrido López, Hugo Infante Pino, Irene Lages Cal, Marta López Otero, Manuel Nogueira Sixto, Marta Paniagua García Señorans, Laura Rodríguez Fernández, Alejandro Ruano Poblador, Erika Rufo Crespo, Raquel Sanchez-Santos, Vincenzo Vigorita (Álvaro Cunqueiro Hospital); Ester Alonso Batanero, Dorisme Asnel, Isabel Cifrian Canales, Elisa Contreras Saiz, Irene De Santiago Alvarez, Tamara Díaz Vico, Sebastian Fernandez Arias, Daniel Fernández Martínez, Carmen García Bernardo, Luis Joaquín García Flórez, Carmen Garcia Gutierrez, Manuel García Munar, Carlos Alberto Márquez Zorrilla Molina, Marta Merayo, José Luis Michi Campos, Maria Moreno Gijon, Jorge L. Otero-Diez, Jose Luis Rodicio Miravalles, Lorena Solar-Garcia, Aida Suárez Sánchez, Nuria Truan (Central University Hospital Of Asturias); Cristina Alejandre Villalobos, Yurena Caballero Díaz, Marta Jimenez, Dacil Montesdeoca, Antonio Navarro-Sánchez\*, Victor Vega (Complejo Hospitalario Universitario Insular-Materno Infantil); Juan Beltrán de Heredia, Zahira Gómez, Carlos Jezieniecki, Ana Patricia Legido Morán, Mario Montes-Manrique\*, Mario Rodriguez-Lopez, María Ruiz Soriano, Jeancarlos Trujillo Díaz, Andrea Vazquez Fernandez (Hospital Clínico Universitario de Valladolid); Nuria Argudo, Miguel Pera, Laia Torrent Jansà (Hospital del Mar); Melody García Domínguez, Ignacio Goded, Marta Roldón Golet, Issa Talal El-Abur, Alejandra Utrilla Fornals, Vanesa Zambrana Campos (Hospital General San Jorge); Maria Del Mar Aguilar Martinez, Marina Bosch, Luis García-Catalá, Luis Sánchez-Guillén (Hospital General Universitario de Elche); Eva Artigau, Nuria Gomez Romeu, David Julià Bergkvist (Hospital Universitari de Girona Dr. Josep Trueta); Beatriz Espina Perez, Olga Morató, Carles Olona (Hospital Universitari de Tarragona Joan XXIII); Beatriz Diéguez, Alexander Forero-Torres, Manuel Losada (Hospital Universitario del Sureste); Segundo Gomez-Abril, Paula González, Rosario Martinez, Sergio Navarro Martínez, Carmen Payá-Llorente, Álvaro Pérez Rubio, Sandra Santarrufina Martinez, Juan Carlos Sebastián Tomás, Ramon Trullenque Juan (Hospital Universitario Doctor Peset); Alberto Gegúndez Simón, Paloma Maté, Maria Isabel Prieto-Nieto, Ines Rubio-Perez, Aitor Urbiet, Marina Vicario Bravo (Hospital Universitario la Paz); David Abelló, Matteo Frasson, Alvaro Garcia-Granero (Hospital Universitario y Politécnico La Fe); Alfredo Abad Gurumeta, Ane Abad-Motos, Elena Lucena-de Pablo, Beatriz Nozal, Javier Ripollés-Melchor, Rut Salvachúa (Infanta Leonor University Hospital); Esther Ferrero, Luis Garcia-Sancho Tellez, Irene Ortega Vázquez, Antonio L. Picardo, Jose Alberto Rojo López, Laura Patricia Zorrilla Matilla (Infanta Sofía University Hospital); Carmen Cagigas Fernandez\*, Sonia Castanedo Bezanilla, José Estevez Tesouro, Maria Jose Fernandez-Diaz, Juan García Cardo, Marcos Gomez Ruiz, Erik Gonzalez-Tolaretixipi, Jaime Jimeno Fraile, Cristobal Poch, Montserrat Rodriguez-Aguirre, Noemí Troche Pesqueira, Maria Soledad Trugeda-Carrera (Marqués de Valdecilla University Hospital); Javier de la Torre, Ruth Blanco-Colino, Eloy Espin-Basany, Martín Espinosa-Bravo, Clara Morales Comas, Eduardo Reyes Afonso, Joaquín Rivero Déniz, Christian Siso Raber, Mireia Verdaguer Tremolosa (Vall d'Hebron University Hospital).

**Sri Lanka:** Pramodh Chandrasinghe, Sumudu Kumaraage, Nimeshi Wijekoon Arachchilage (North Colombo Teaching Hospital); Kithsiri Janakantha Senanayake (Teaching Hospital Anuradhapura).

**Sudan:** Ahmed Abdalla Ahmed Elkamel (Ibrahim Malik Teaching Hospital); Mohammed A. Adam (Soba University Hospital); Mahmoud Saleh (University of Gezira Hospital).

**Sweden:** Nina Blomme, Anders Thorell, Fredrik Wogensen (Ersta Hospital); Andreas Älgå\*, Dhirar Ansarei, Fuat Celebioglu, Göran Heinius, Linda Nigard, Emil Pieniowski (South General Hospital); Sandra Ahlqvist, Ida Björklund, Yucel Cengiz, Andreas Frånberg, Martina Håkansson (Sundsvall Hospital); Karin Adamo, Oskar Franklin, Malin Sund, Rebecca Wiberg (Umea University Hospital); Yvette Andersson, Abbas Chabok, Maziar Nikberg (Västmanlands Hospital Västerås); Alexander Kugelberg (Vrinnevi Hospital).

**Switzerland:** Claudia Canonica, Dimitrios Christoforidis\*, Fabrizio Fasolini, Paolo Gaffuri, Mauro Giuliani, Francesco Meani, Sotirios Georgios Popeskou, Silvia Pozza, Wiebke Wandschneider (Ente Ospedaliero Cantonale); Lorenz Peterer, Lukas Werner Widmer\*, Bernd Zimmermann (Kantonsspital Graubunden); Panagiotis Bakoleas, Iris Chanousi, Lydia Charalampidou, Lukasz Filip Grochola, Franziska Heid, Sotirios Ntaoulas, Michail Outos, Georgios Peros\*, Hanna Podolska-Skoczek, Katharina Beate Reinisch, Christian Zielasek (Kantonsspital Winterthur); Daniel Clerc\*, Nicolas Demartines, Jérôme Gilgien, Amanuel Kefleyesus, Pénélope St-Amour, Arnaud Toussaint (Lausanne University Hospital CHUV).

**Syrian Arab Republic:** Maryam Alhimyar, Bayan Alsaïd, Amr Alyafi (Al-Assad University Hospital); Ahmad Alkhaledi, Basel Kouz, Ahmad Omarain (Al-Bairouni University Hospital); Yusra Al-Sabbagh, Haya Alkhatib, Samer Sara (Al-Mouwasat University Hospital); Ahmad Alhaj, Aghyad Danial, Lama Kadoura (Aleppo University Hospital); Sarah Maa Albared, Yamen Monawar, Louei Nahas (Damascus Hospital); Barook Abd, Ahmad Saad, Habib Wakkaf (Tishreen University Hospital).

**Tunisia:** Hanen Bouaziz, Hatem Bouzaïene, Montassar Ghalleb (Institut Salah Azaïez).

**Turkey:** Elif Akaydin, Ata Cem Akbaba, Onur Atakul, Ege Baltacı, Sevval Besli, Gökçen Burgu, Ulukan Cenal, Cansu de Muijnck, Hasan Can Demirkaya, Alper Dogruoz, Zeynep Ipek Gezer, Yasemin Gündoğdu, Merve Kara, Hasan Kürşad Korkmaz, Gökalp Kağan Kurtoğlu, Volkan Ozben, Berk Baris Ozmen, Ahmet Murat Pektaş, Eda Kübra Sel, Nilüfer Yenidünya (Acibadem Atakent Hospital); Fuat Baris Bengur, Berke Mustafa Oral, Tahir Koray Yozgatli (Acibadem Maslak Hospital); Seymur Abdullayev, Mehmet Emin Gunes, Nuri Alper Sahbaz (Bakirkoy Dr. Sadi Konuk Training And Research Hospital); Tuba Banaz, Kübra Kargıcı, Omer Faruk Kuyumcu, Erkan Yanıkoğlu, Merve Yeşilsancak, Duygu Yılmaz (Cerrahpasa Medical Faculty Istanbul University); Melik Kagan Aktas, Ahmet Rencuzogullari (Cukurova University Faculty of Medicine); Arda Isik (Erzincan University Hospital); Sezai Leventoğlu, Ali Yağcınkaya, Osman Yüksel (Gazi University Medical Faculty Hospital); Mustafa U Kalaycı, Yasin Kara, Inanc Samil Sarici (Kanuni Sultan Suleyman Training and Research Hospital); Alp Akin, Gökçe nur Alemdağ, Ekin Arslan, Bahadır Emre Baki, Muhammed Selim Bodur, Adnan Calik, Bahar Candas Altınbas, İrem Cihanyurdu, Oğuz Erkul, Burak Gül, Ali Guner, Beyza Köse, Anil Semiz, Şule Sevim, Serkan Tayar, Kadir Tomas, Ozan yavuz Tüfek, Serdar Türkyılmaz, Mehmet Uluşahin, Arif Usta, Reyhan Yıldırım (Karadeniz Technical University Farabi Hospital); Sertaç Ata Güler, Ozan Can Tatar, Ecenur Varol (Kocaeli University Teaching Hospital); Busenur Kirimtay, Muhammed Uysal, Alp Yıldız (Memorial Ankara Hospital); Emin Kose (Okmeydanı Training And Research Hospital); Ahmet Burak Ciftci, Elif Çolak, Huseyin Eraslan, Gultekin Ozan Kucuk, Kürşat Yemez (Samsun Training and Research Hospital).

**Uganda:** Herman Lule\* (Fort Portal Regional Referral Hospital); Mumbere Bienfait, Herman Lule\* (Kampala International University Teaching Hospital); Emmanuel Bua, Matthew Doe\*, Noella Okalany (Mbale Regional Referral Centre); Arianna Birindelli\* (St. Kizito Hospital).

**Ukraine:** Maksym Basarab\*, Oleksii Bielosludtsev, Maryna Freigofer, Kateryna Kolhanova, Kateryna Perepelytsia, Kateryna Romanukha, Dmytro Savenkov, Stanislav Siryi, Maksym Tereshchenko, Nezamai Viacheslav, Anton Volovetskyi (Dnepropetrovsk Regional Clinical Oncology Center); Andrey Kebkalo, Yegor Tryliskyi, Volodimir Tyselskiy (Kyiv Regional Clinical Hospital).

**United Kingdom:** Eilidh Bruce, Bing Lun Chow, Emma Iddles, Sarah McGuckin, Nicola Newall, George Ramsay, Parivrudh Sharma, Caitlin Stewart, Jeremy Wong (Aberdeen Royal Infirmary); Abdul Badran, Michael Bath\*, Fanny Belais, Eman Butt, Kaustuv Joshi, Milan Kapur, Mike Shaw, Adam Townson, Christopher Yee Khang Williams (Addenbrooke's Hospital); Timothy Gray, Robert Greig, Mansoor Husain, Elspeth Murray, Ahmed Mustafa (Borders General Hospital); Ashar Asif, Arya Gokul, Max Shah (Bristol Royal Infirmary); Mabel Temisanren Akitikori, Alexandros Charalabopoulos (Broomfield Hospital); Sophie Davidson, Sinead McNally,

Shamil Rupani (Causeway Hospital); Fatema Juma, Sarah Catherine Mills, Laura Muirhead, Kate Sellars, Una Walsh, Oliver Warren (Chelsea and Westminster Hospital); Alice Chambers, Richard Hunt, Ella Teasdale (Cheltenham General Hospital); Stephen Boyce, Hannah Cornwall, Isabel Tol (Churchill Hospital); Eleftherios Orestis Argyriou, Nicola Eardley, Meical Povey (Countess of Chester Hospital); Joanna M S Aithie, Ahmer Irfan, Mari-Claire McGuigan, Robert Starr, Craig Russell Warren (Gartnavel General Hospital); Jess Archibald, Georgia Kirby, Ivan Kisiov (Gloucestershire Royal Hospital); Chun Kheng Khoo, Rachel Lee, Dana Photiou (Grantham and District Hospital); Rowan Davis, Uday Prasad, P Zichu Yang (Hairmyres Hospital); Jonathan Bird, Edmund Leung, Virginia Summerour (Hereford County Hospital); Chelise Currow, Jianshen Kiam, Gerald Jack Soon Tan (Ipswich Hospital); Anitha Muthusami, Ibifunke Pegba-Otemolu, Tomas Urbonas (John Radcliffe Hospital); Joseph Nunoo-Mensah, Edgaras Smolskas (King's College Hospital); Alex Boddy, Gianpiero Gravante, David Hunter (Leicester Royal Infirmary); David Andrew, Amanda Koh, Amari Thompson (Lincoln County Hospital); Lawrence Adams, Hollie A Clements, Kasun De Silva, Ogonnia Ekpete, Seraj Haque, Scott Henderson, Bilal Ibrahim, Thummini Jayasinghe, Jennifer Livie, Keir Mailley, Gopikrishnan Nair, Daniel Tan (Ninewells Hospital); Caitlin Baggaley, Aleksander Dawidziuk, Bartosz Szyszka (Northwick Park Hospital); Charlotte Barter, Nirav Gandhi, Karen Hassell, Samantha Hitchin, Jennett Kelsall, Eva Nagy, Ashrafun Nessa, Lisa Whisker, Fady Yanni (Nottingham City Hospital); Mahmoud Ali, Deeksha Arora, Sunanda Hediwattege, Navam Kumarasinghe, Munir Rathore, Athula Tennakoon (Pilgrim Hospital); Syed Mustafa Ali Ahmad, Oreoluwa Bajomo, Fahema Nadira (Princess Alexandra Hospital); Valerio Celentano (Queen Alexandra Hospital); Aneel Bhangu, James Glasbey, Ewen Griffiths, Rama Santhosh Karri, Jason Kei Chak Mak, Dmitri Nepogodiev, Michelle Pipe (Queen Elizabeth Hospital Birmingham); Muhammad Iqbal Bhatti, Mohamed Rabie (Queen Elizabeth Hospital King's Lynn); Connor Boyle, David Hamilton, Aishath Mihuna, James Chean Khun Ng, Gary Nicholson, Agata Oliwa, Robert Pearson, Anna Rose, Shun Qi Yong (Queen Elizabeth University Hospital); Catherine Boereboom, Michael Hanna, Catherine Walter (Queens Medical Centre); Thomas Samuel Greensmith, Rachel Mitchell, Eimear Monaghan (Raigmore Hospital Inverness); James Crawford, Susan Moug (Royal Alexandra Hospital); James Blackwell, Hannah Boyd-Carson, Philip Herrod (Royal Derby Hospital); Omar Al-Allaf, Miriam Beattie, Cameron Bullock, Shivang Burman, Gemma Clark, Nicolas Flamey, Oliver Flannery, Alexander Harding, Ben Kodiatt, Samuel Lawday\*, Shivani Mahapatra, Navin Mukundu Nagesh, Michael Ng, Dupinderjit Rye, Andrel Yoong (Royal Devon and Exeter Hospital); Laura Clark, Chris Deans, Monisha Edirisooriya, Cameron Fairfield, Ewen M Harrison (Royal Infirmary of Edinburgh); Emma Victoria Carrington, Tsz Lun Ernest Wong, Baasil Yusuf (Royal London Hospital); Carla Chamberlain, Kathryn Duke, Elizabeth Kmiotek (Royal Surrey County Hospital); Azel Botes, Natalie Condie\*, Timothy Schrire, Reena Shah, Iolo Thomas-Jones, Charlotte Yates (Southmead Hospital); Natasha Anthony, Edward Matthews, Kapil Sannan, James Tankel, Sally Tucker, Jasmine Winter Beatty, Paul Ziprin (St Mary's Hospital); William Duggan, Anastasia Kantartzi, Shruthi Sridhar (St Thomas' Hospital); Rachel Alys Khaw, Prakhar Srivastava, Charlotte Underwood (The Christie Hospital); Homero Alves do Canto Brum, Sharat Chopra, Laura Davis (University Hospital of Wales); Rebecca Hughes, Joshua Tulley (Walsall Manor Hospital); Justin Alberts, Thomas Athisayaraj, Mojolaoluwa Olugbemi (West Suffolk Hospital); Kasim Ahmad, Claudia Chan, Gavin Chapman, Hannah Fleming, Benjamin Fox, Julia Grewar, Kate Hulse, Duncan Rutherford, Mackay Sinead, Scott Smith, Doug Speake\*, Peter G Vaughan-Shaw (Western General Hospital); Natasha Christodoulides, Simrit Kudhail, Matthew Welch (Wexham Park Hospital); Syed Muhibullah Husaini, Simon Lambracos (Worthing Hospital).

**United States:** Chikamuche Anyanwu, Rishi Suresh, Jimmy Scott Thomas (Baylor Scott&White Medical Center); Elizabeth Gleeson, Rebecca Platoff, Areeba Saif (Hahnemann University Hospital); Zachary Enumah, Eric Etchill, Alodia Gabre-Kidan (Johns Hopkins Hospital); Mitchell Bernstein, Francesco Maria Carrano, Joseph Connors, Patricio Lynn, Marcovalerio Melis, Elliot Newman (NYU Langone Medical Center); Deshka S Foster, Kenneth Perrone, Ashley Titan, Thomas G Weiser (Stanford Health Care); Sarwat Ahmad, Andrea Chao M. D. Bafford, Marco Dal Molin, Nader Hanna, Syed Nabeel Zafar (University of Maryland Hospital); Mark Hemmila,

Lena Napolitano, Jane J Wong (University Of Michigan Medical Center); Julia Chandler, Lauren Wood, Sherry Wren (VA Palo Alto Hospital); Taylor Ottesen, Lucia You, Kristin Yu (Yale New Haven Hospital).

**Uruguay:** María del pilar Arciénega Yañez, Martin Ferreira Fernandes, Daniel González (Cooperativa Medica de Florida); Santiago Cubas, María Catalina González, Vanessa Zubiaurre (Hospital De Clinicas); Rodrigo Demolin, Nicolas Giroff, Pablo Sciuto (Hospital Espanol); Maite Campos, Gabriela Rodríguez Cantera, Gabriela Wagner (Hospital Maciel).

**Zambia:** Garg Deepika, Mayaba Maimbo, Elliot Simuchimba (Kitwe Teaching Hospital); Anadi Bulaya, Chali Chibuye, Bright Chirengendure (Ndola Central Hospital); Mary-Rose Kabale, Kizito Kabongo, David Linyama, James Munthali, Oliver Mweso, Francis Pikiti (University Teaching Hospital).

#### Data Validators

**Australia:** James Otieno (Calvary Mater Newcastle); Erick Chan (Gold Coast University Hospital); Log Tung Lai (Gosford Hospital); Brigid Blackman (Gosford Private Hospital); Sophie Richards (John Hunter Hospital); Suren Subramaniam (Peter MacCallum Cancer Centre); Rafid Karim (Princess Alexandra Hospital); Nathan Kok (Redcliffe Hospital); Yanni Dion Lee (Royal Adelaide Hospital); Shabina Ali (The Queen Elizabeth Hospital); Aanjaneya Sinha (The Wesley Hospital); Robert Corrigan (Toowoomba Hospital); Nicole Barnes (University Hospital Geelong); Florence Wong (Westmead Hospital); Grace Dennis (Wyong Public Hospital).

**Austria:** Julia Jedamzik (General Hospital of Vienna).

**Barbados:** Emil Phillips (Queen Elizabeth Hospital).

**Belgium:** Wivine Piette (Grand Hopital de Charleroi - Site Saint-Joseph); Marie Van hentenryck (Hôpitaux Iris Sud - Etterbeek-Ixelles).

**Benin:** Houenoukpo Koco (Centre Hospitalier Universitaire et Departemental Oueme Plateau); Souliath Lawani (Centre National Hospitalier et Universitaire Hubert Koutoukou Maga).

**Botswana:** Mamo Woldu Kassa (Princess Marina Hospital).

**Brazil:** Tainá Santos Bezerra (Hospital Santa Casa de Misericordia de Maceio).

**Bulgaria:** Petar Gribnev (University Hospital Alexandrovska); Dobromir Dimitrov (University Hospital Dr Georgi Stranski); Panche Krastev (University Hospital Eurohospital).

**Cambodia:** Sovannarith Oum (World Mate Emergency Hospital).

**Cameroon:** Divine Tim Bonghaseh (Baptist Hospital).

**Canada:** Maryam Al Farsi (Jewish General Hospital); Nourah Alsharqawi (McGill University Health Center); Arnav Agarwal (Sunnybrook Hospital).

**Colombia:** Veronica Acevedo (CES Clinic); Andrea Carolina Castillo Barbosa (Fundacion Cardioinfantil-IC); Felipe Giron (Hospital Universitario Mayor Méderi); Jimmy Paul Leon Rodriguez (Hospital Universitario San Vicente Fundacion).

**Croatia:** Darko Kučan (Clinical Hospital Merkur); Damir Rosko (General Hospital Dr. Josip Bencevic); Neven Barsic (University Hospital Center Sestre milosrdnice); Domagoj Župan (Zadar General Hospital).

**Czech Republic:** Amgad Hegazi (Charles University Hospital); Vendula Trunčíková (Slezská nemocnice v Opavě, p.o.); Vladimír Fryba (The General University Hospital in Prague).

**Egypt:** Mostafa Mohamed (Ain Shams University Specialized Hospital); Ahmed Sultan (Al-Tagamoh Hospital); Ahmed Nagi (Alexandria Main University Hospital); Abdallah Rashad Temerik (Assiut University Hospital); Mohamed Elemam Elshawy (El Demerdash University Hospital); Moustafa Ibrahim Mahmoud (Gamal Abd El Nasser Hospital); Shrouk Omar (Kasr Alainy Hospital, Faculty of Medicine, Cairo University); Mohamed Anwar (Mansoura University Hospital); Tarek Rageh (Menofiya University Hospital); Aya Elmokadem (National Cancer Institute); Khaled Gaballa (Oncology Center Mansoura University).

**Estonia:** Sandra Teppo (The North Estonia Medical Centre).

**Finland:** Antti Turunen (Helsinki University Hospital); Pasi Pengermä (Kanta-Hame Central Hospital).

**France:** Quentin Ballouhey (CHU Limoges); Damien Bergeat (CHU Rennes - General Surgery); Ariane Weyl (CHU Toulouse); Elisabeth Hain (Hôpital Cochin - APHP).

**Ghana:** Adam Gyedu (Komfo-Anokye Teaching Hospital); Edwin Yenli (St. Patrick's Hospital); Dorcas Osei-Poku (Tamale Teaching Hospital).

**Greece:** Vaia-Aliki Rompou (Agios Savvas Anticancer Hospital); Athanasios Zoikas (Athens Medical Center); Apostolos Gaitanidis (Attikon University General Hospital); Georgios Koukis (General Hospital of Nikaia); Konstantinos Perivoliotis (General University Hospital of Larissa); Panagiotis Tavlas (General University Hospital of Patras); Konstantinos Galanos-Demiris (George Papanikolaou General Hospital of Thessaloniki); George Zografos (Hippocratio General Hospital); Ioannis Karavokyros (Laiko University Hospital); Georgia Xanthopoulou (Naval And Veterans Hospital); Eirini Iordanidou (Serres General Hospital).

**Guatemala:** Fernanda Ayau (Hospital General De Enfermedades); Allan Garcia (Hospital General San Juan De Dios).

**Hungary:** Pekli Damján (1st Department of Surgery - Semmelweis University).

**India:** Deepender Wason (Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences); Ashika B L (Victoria Hospital).

**Indonesia:** Ervandy Rangganata (Dr Cipto Mangunkusumo National General Hospital).

**Ireland:** Perna Kamath (St. James's Hospital); Donal B O'Connor (Tallaght Hospital).

**Italy:** Margherita Pinto (Azienda Ospedaliera Regionale 'San Carlo'); Fabrizio Perrone (Azienda Ospedaliera Universitaria Consorziata Policlinico Di Bari); Francesca Paola Tropeano (Federico II University of Naples); Francesca Troilo (Hospital G.Bernabeo); Daniela Bossi (ICS Maugeri); Dario Scala (Istituto Nazionale Tumori Fondazione, Pascale-I.R.C.C.S.); Lucrezia Pulitanò (Mater Domini University Hospital); Marcella Carella (Ospedale Generale Regionale F. Miulli); Andrea Pietrabissa (Policlinico San Matteo); Alice Gori (S.Orsola-Malpighi Hospital); Giorgio Giraud (Santa Croce and Carle Hospital); Veronica De Simone (Santa Rita Clinic, Vercelli); Alfio Alessandro Russo (Treviglio Hospital); Bartolomeo Braccio (Università della Campania 'Luigi Vanvitelli', Naples).

**Jordan:** Raed Al-Taher (Jordan University Hospital); Sarah Athamneh (King Abdullah University Hospital).

**Kenya:** Andrea Parker (Tenwek Hospital).

**Libya:** Adnan Sawiee (Alkhadra Hospital); Amina Kattia (Misurata Cancer Center); Malik Salem (National cancer institute); Osama Tababa (New Bridge Hospital); Zuhour Shaeab (Tripoli Central Hospital).

**Lithuania:** Vilius Syminas (Klaipeda Republic Hospital); Jonas Jurgaitis (Klaipeda University Hospital); Gytė Damulevičienė (Lithuanian University of Health Sciences Kaunas Clinical Hospital); Saulius Svagzdys (Lithuanian University of Health Sciences Kaunas Clinics); Tomas Poskus (Vilnius University Hospital).

**Madagascar:** Narindra Njarasoa Mihaja Razafimanjato (Joseph Ravoahangy Andrianavalona Hospital).

**Malaysia:** Ling Chieng Loo (Hospital Sibul); Ing Ching Tiong (Hospital Sultanah Bahiyah); Wan Farahiyah Wan Muhammad (Hospital Tuanku Ja'afar); Harinthiran Vijeyan (Hospital Universiti Sains Malaysia); Teoh Li Ying (University Malaya Medical Centre).

**Malta:** Gabriella Grech (Mater Dei Hospital).

**Mexico:** Rodrigo Arrangoiz (ABC Medical Center); Vania Brickelia Jimenez Ley (ANKER Oncologia Global Especializada); Daniel Arizpe (Hospital Angeles Puebla); Vania Brickelia Jimenez Ley (Hospital de Especialidades, CMNO-IMSS); Elizabeth Lagunes Lara (Hospital Español Veracruz); Elizabeth Victoria Castro López (Hospital Regional de Alta Especialidad); Jose Eaazim (Instituto Nacional de Ciencias Médicas y Nutrición 'Salvador Zubirán').

**Netherlands:** Marije Gordinou de Gouberville (Amsterdam UMC VUmc); Vivian Bastiaenen (Amsterdam UMC, University of Amsterdam); Simone Rottier (Tergooi Hospital).

**New Zealand:** Fouad Nahab (North Shore Hospital); Maria Yeonhee Ji (Taranaki Base Hospital).

**Nigeria:** Mohammed Seyoji (Ahmadu Bello University Teaching Hospital); Callistus Nwachukwu (Aminu Kano Teaching Hospital); Okechukwu Emeghara (Babcock University Teaching Hospital); Sayyid Egbunu Muhammed (Barau Dikko Teaching Hospital); Ayodeji Idowu (Ekiti State University Teaching Hospital); Olamiposi Sowemimo (Obafemi Awolowo University Teaching Hospitals Complex); Olakayode Ogundoyin (University College Hospital); Oluwatosin Akande (University of Ilorin Teaching Hospital).

**Norway:** Alexander Lott (University Hospital Of North Norway).

**Pakistan:** Maliha Nadeem (Ganga Ram Hospital); Ahsan Ali Laghari (Liaquat University of Medical & Health Sciences); Asif Loya (Shaukat Khanam Memorial Cancer Hospital and Research Centre); Hassan Mushtaq (Sindh Institute of Urology and Transplantation); Muhammad Tariq Abdullah (The Pakistan Institute of Medical Sciences).

**Palestine:** Baseel Abuhilal (Al Makassed Islamic Charitable Society Hospital Jerusalem); Mohammad Atawneh (Al-Ahli Hospital); Hamdan Hamdan (Beit Jala Governmental Hospital (Al Hussein)); Belal Alhabil (Indonesian Hospital); Abedelrahman Srour (Palestine Medical Complex); Ibrahim Mousa (Rafidia Hospital).

**Paraguay:** Luis Da Silva Medina (Hospital de Clínicas, II Cátedra de Clínica Quirúrgica, Universidad Nacional de Asunción).

**Philippines:** Marie Dione Sacdalan (José R. Reyes Memorial Medical Center); Marie Carmela Lapitan (Philippine General Hospital, University Of The Philippines Manila); Marie Dione Sacdalan (Quirino Memorial Medical Center); Marie Dione Sacdalan (The Medical City).

**Poland:** Katarzyna Bartosiak (Military Institute Of Medicine).

**Portugal:** Pedro Ferreira (Centro Hospitalar de Setúbal); Vítor Francisco (Centro Hospitalar do Baixo Vouga); Ricardo Lemos (Centro Hospitalar do Medio Ave); Luísa Frutuoso (Centro Hospitalar Entre o Douro e Vouga); Sara Fernandes (Centro Hospitalar Lisboa Norte); Telma Fonseca (Centro Hospitalar Sao Joao); Jorge Pereira (Centro Hospitalar Tondela-Viseu); Juan Rachadell (Centro Hospitalar Universitario do Algarve); Ana Torre (Centro Hospitalar Vila Nova de Gaia/Espinho); Filipe Madeira Martins (Hospital da Horta, E.P.E.); Ana Cristina Carvalho (Hospital da Senhora da Oliveira); Joana Rodrigues Ferreira (Hospital de Egas Moniz); Bruno Ribeiro da Silva (Hospital de Santa Luzia); Helena Devesa (Hospital de Santarem); Ana Vieira (Hospital de Santo Espirito da ilha Terceira); Inês Mónica (Hospital Distrital da Figueira da Foz); Margarida Amaro (Hospital do Espirito Santo); Diogo Sousa (Hospital do Litoral Alentejano); Marta Reia (Hospital Doutor José Maria Grande); João Louro (Hospital Geral - Centro Hospitalar de Coimbra);



Ana Martins (Hospital Prof. Doutor Fernando Fonseca, E.P.E.); Joaquina Dominguez (Hospital Santa Luzia Elvas); Inês Santos (Hospital Sao Francisco Xavier); Nuno Miguel Freitas Oliveira (Hospital Vila Franca de Xira); José Carlos Pereira (IPO Porto); Pedro Silva-Vaz (Unidade Local de Saúde de Castelo Branco); Ligia Freire (Unidade Local de Saude de Matosinhos - Hospital Pedro Hispano); Ricardo Escrevente (Unidade Local de Saude do Baixo Alentejo).

**Romania:** Valentina Madalina Negoita (Emergency Clinical Hospital Bucharest).

**Russian Federation:** Dmitry Shakhmatov (State Scientific Centre of Coloproctology).

**Rwanda:** Yves Nezerwa (Rwanda Military Hospital).

**Serbia:** Radosav Radulovic (Zvezdara University Medical Center).

**South Africa:** Rachel Moore (Chris Hani Baragwanath Academic Hospital); Gareth Obery (Groote Schuur Hospital); Francois Viljoen (Inkosi Albert Luthuli Central Hospital); Tome Mendes (Mitchell's Plain District Hospital).

**Spain:** Antonio Suarez (12 de Octubre University Hospital); Enrique Moncada (Álvaro Cunqueiro Hospital); Maria Fernandez-Hevia (Central University Hospital Of Asturias); Carolina Curtis Martínez (Hospital General Universitario de Elche); Julia Maria Gil Garcia (Hospital Universitari de Girona Dr. Josep Trueta); Mariana González Zunzarren (Infanta Sofia University Hospital).

**Sudan:** Tarig Idris (Ibrahim Malik Teaching Hospital).

**Sweden:** Karolina Eklöv (South General Hospital); Oskar Grahn, Leila Amin (Umea University Hospital); Malin Blomqvist (Vrinnevi Hospital).

**Switzerland:** Costanza Ajani (Ente Ospedaliero Cantonale); Rebecca Kraus (Kantonsspital Graubunden); Nico Seeger (Kantonsspital Winterthur); Melissa Willemin (Lausanne University Hospital CHUV).

**Syrian Arab Republic:** Fadi Rayya (Al-Assad University Hospital); Mohammad Ayash (Al-Bairouni University Hospital); Raneem Msouti (Al-Mouwasat University Hospital); Israa Kannas (Aleppo University Hospital); Eias Abazid (Damascus Hospital); Asil Esper (Tishreen University Hospital).

**Tunisia:** Skander Slim (Institut Salah Azaiez).

**Turkey:** Akil Serdar Kavcar (Acibadem Atakent Hospital); Erman Aytac (Acibadem Maslak Hospital); Ahmet Cem Dural (Bakirkoy Dr. Sadi Konuk Training And Research Hospital); Ayse Ilker (Cerrahpasa Medical Faculty Istanbul University); Ismail Cem Eray (Cukurova University Faculty of Medicine); Eray Kurnaz (Erzincan University Hospital); Saygin Altiner (Gazi University Medical Faculty Hospital); Mustafa Deniz Tepe (Karadeniz Technical University Farabi Hospital); Can Şahin (Memorial Ankara Hospital); Evrim Savli (Samsun Training and Research Hospital).

**Uganda:** Aryon Innocent (Fort Portal Regional Referral Hospital); Lilian Babirye (Kampala International University Teaching Hospital).

**Ukraine:** Andrii Diachenko (Dnepropetrovsk Regional Clinical Oncology Center); Vladislav Hordoskiy (Kyiv Regional Clinical Hospital).

**United Kingdom:** Heather Curry (Aberdeen Royal Infirmary); Charlene Yat Che Chau (Addenbrooke's Hospital); Harry Robertson (Bristol Royal Infirmary); Arin Mahmoud (Broomfield Hospital); Hannah Lennon (Countess of Chester Hospital); Lynette Loi (Gartnavel General Hospital); Emily Kirkham (Gloucestershire Royal Hospital); Cameron McCann (Hairmyres Hospital); Daniel Watts

(John Radcliffe Hospital); Binay Gurung (Leicester Royal Infirmary); Michael Wilson (Ninewells Hospital); Thomas Tribedi (Nottingham City Hospital); Eleonora Garofalo (Queen Alexandra Hospital); Baryab Zahra (Queen Elizabeth University Hospital); Scott MacDonald (Royal Alexandra Hospital); Ian Daniels (Royal Devon and Exeter Hospital); Nathan Ng (Royal Infirmary of Edinburgh); Shivun Khosla (Royal Surrey County Hospital); James Olivier (Southmead Hospital); Sum Yu Pansy Yue (St Thomas' Hospital); Gayathri Suresh (The Christie Hospital); Jack Wellington (University Hospital of Wales); Emmanuel Lorejo (West Suffolk Hospital); Mafdi Mossaad (Wexham Park Hospital); Yegor Trylisky (Worthing Hospital).

**United States:** Madison Crutcher (Hahnemann University Hospital); Marjan Alimi (NYU Langone Medical Center); Ioana Baiu (Stanford Health Care); Hossam Abdou (University of Maryland Hospital); Alison Conway (VA Palo Alto Hospital); Connor Peck (Yale New Haven Hospital).

**Uruguay:** Gabriela Wagner (Hospital De Clinicas); Mauro Andres Perdomo Perez (Hospital Espanol); Ivan Trostchansky (Hospital Maciel).

**Zambia:** Stanley Zulu (Kitwe Teaching Hospital); Mildred Nakazwe (University Teaching Hospital).

#### Protocol Authors

Stephen R Knight, Thomas M Drake, Dmitri Nepogodiev, J Edward F Fitzgerald, Adesoji O Ademuyiwa, Philip Alexander, Jean C Allen Ingabire, Sara W. Al-Saqqa, Bruce Biccard, Giuliano Borda, David Borowski, Sule Burger, Kathryn Chu, Damian Clarke, Ainhoa Costa, Justine Davies, Rachel Donaldson, Chikwendu Ede, O James Garden, Dhruv Ghosh, James C. Glasbey, T Peter Kingham, Hosni Khairy Salem, Anyomih Theophilus Kojo, Zach Koto, Marie Carmela Lapitan, Ismail Lawani, Chiapo Lesetedi, Maria Lorena Aguilera, Charles Mabedi, Mayaba Maimbo, Laura Magill, Felix Makinde Alakaloko, Alex Makupe, Janet Martin, Antonio Ramos De la Medina, Mark Monahan, Rachel Moore, Vanessa Msosa, Solomon Mulira, Alphonse Zeta Mutabazi, Elmi Muller, Joseph Musowoyo, Adewale Oluseye Adisa, Jean Léon Olory-Togbe, Riinu Ots, Ahmad Uzair Qureshi, Sarah Rayne, Tracey Roberts, Emmy Runigamugabo, Marie Dione Parreno-Sacdalan, Catherine Shaw, Neil Smart, Martin Smith, Richard Spence, Steph van Straten, Stephen Tabiri, Viki Tayler, Azmina Verjee, Thomas G Weiser, John Windsor, Joseph Yorke, Raul Yepez, Richard Lilford, Dion Morton, Aneel Bhangu, Sudha Sundar, Ewen M Harrison.

#### Protocol Translators

José Chen, Leonid Daya, Nouhaila El Aroussi, Valeria Farina, Tchianze Gnintedeme Olivier, Mauricio Gonzales Nacarino, Aamr Hammani, Sarah Honjo, Rebecca Jacobs, Hitomi Kimura, Andrey Litvin, Mugisha Nkoronko, Ibrahim Nour, Jasson Javier Oscullo Yepez, Gianluca Pagano, Francesco Pata, Wei Pin Hung, Ankit Raj, Alina Romani Pozo, Muna Rommaneh, Samuel Chimbioputo Sassamela Fabiano, Camila Milagros Shiroma Gago, Sebastian Shu Yip, Abhishekh Srinivas, Chia-Yen Sung, Aswan Tai, Yener Cristyell Valle Aranda, Sara Venturini, Dominique Vervoort, Jean Wilguens Lartigue.