

## Supplementary data

Table 2. Regression results from Poisson regression on a count variable indicating the number of suggested operations (0–5) (= dependent variable)

Variable	Model 1 <sup>a</sup>	p >  z	95% CI	Model 2 <sup>a</sup>	p >  z	95% CI
Risk-averse	0.96	0.57	0.83–1.11	0.96	0.63	0.82–1.13
Macho attitude				1.04	0.003	1.01–1.06
Self-confidence				1.02	0.12	0.99–1.05
Impulsiveness				0.98	0.25	0.95–1.01
Anti-authority				0.99	0.64	0.97–1.02
Worry				1.02	0.08	1.00–1.04
Resignation				1.02	0.13	0.99–1.05
Experience:						
Resident				REF		
0–5 years				0.91	0.30	0.76–1.09
5–10 years				0.97	0.68	0.83–1.13
> 10 years				0.85	0.08	0.72–1.02
Female				1.08	0.28	0.94–1.24
Intercept	2.83	0.000	2.54–3.16	1.06	0.88	0.50–2.26

<sup>a</sup> Values are incidence rate ratio

CI: confidence interval

n = 354; standard errors are clustered at the hospital level. Explanatory variables: (i) attitudes: macho, self-confidence, impulsivity, anti-authority, worry, and resignation are continuous variables measured on a scale ranging from 5 to 25, (ii) risk-averse takes a value of 1 for risk-averse surgeons and 0 otherwise, (iii) experience has 4 categories, (iv) female takes a value of 1 for female surgeons and 0 otherwise. Model 1 tested the primary hypothesis that risk-averse surgeons were less likely to suggest an operation. We also included explanatory variables describing hazardous attitudes and doctor's experience and gender in model 2, in order to investigate whether these factors were associated with the tendency to operate.

Table 3. Mixed-effects Poisson regression on a count variable indicating the number of suggested operations (0–5) (= dependent variable)

Variable	Model 3 <sup>a</sup>	p >  z	95% CI
Risk-averse	0.97	0.70	0.85–1.11
Macho	1.03	0.002	1.01–1.06
Self-confidence	1.03	0.10	1.00–1.06
Impulsiveness	0.98	0.14	0.95–1.01
Anti-authority	1.00	0.86	0.97–1.03
Worry	1.02	0.07	1.00–1.04
Resignation	1.02	0.16	0.99–1.05
Experience:			
Resident	REF		
0–5 years	0.93	0.49	0.75–1.15
5–10 years	0.99	0.92	0.80–1.22
> 10 years	0.87	0.19	0.71–1.07
Female	1.06	0.49	0.89–1.26
Intercept	0.95	0.90	0.46–1.99
Variance component	0.04		0.02–0.12

<sup>a</sup> Values are incidence rate ratio

CI: confidence interval

n = 354. Explanatory variables: (i) attitudes: macho, self-confidence, impulsiveness, anti-authority, worry, and resignation are continuous variables measured on a scale ranging from 5 to 25, (ii) risk-averse takes a value of 1 for risk-averse surgeons and 0 otherwise, (iii) experience has 4 categories, (iv) female takes a value of 1 for female surgeons and 0 otherwise.

Table 4. Poisson regression on a binary variable indicating whether a surgeon recommended at least one surgery (= dependent variable)

Variable	Model 1 <sup>a</sup>	p >  z	95% CI	Model 2 <sup>a</sup>	p >  z	95% CI
Risk-averse	0.92	0.07	0.84–1.01	0.92	0.07	0.84–1.01
Macho				1.02	0.008	1.01–1.04
Self-confidence				1.01	0.17	0.99–1.03
Impulsiveness				0.98	0.06	0.96–1.00
Anti-authority				1.00	0.62	0.98–1.01
Worry				1.01	0.09	1.00–1.02
Resignation				1.02	0.03	1.00–1.04
Experience:						
Resident				REF		
0–5 years				1.00	0.87	0.92–1.11
5–10 years				0.92	0.17	0.81–1.04
> 10 years				0.87	0.009	0.78–0.96
Female				1.02	0.74	0.92–1.12
Intercept	0.86	0.000	0.81–9.01	0.50	0.006	0.31–0.82

<sup>a</sup> Values are incidence rate ratio

CI: confidence interval

n = 354; standard errors are clustered at the hospital level. Explanatory variables: (i) attitudes: macho, self-confidence, impulsivity, anti-authority, worry, and resignation are continuous variables measured on a scale ranging from 5 to 25, (ii) risk-averse takes a value of 1 for risk-averse surgeons and 0 otherwise, (iii) experience has 4 categories, (iv) female takes a value of 1 for female surgeons and 0 otherwise. Model 1 tested the primary hypothesis that risk-averse surgeons were less likely to suggest an operation. We also included explanatory variables describing hazardous attitudes and doctor's experience and gender in model 2, in order to investigate whether these factors were associated with the tendency to operate.

## Supplement: translation of the Hazardous Attitude Scale—aviation

Attitude	Aviation	Orthopedic surgeon English <sup>b</sup>	Orthopedic surgeon Swedish
1 Self-confidence	I am a pilot due entirely to my hard work and ability	I am a surgeon due entirely to my own hard work and ability	Jag har blivit ortoped tack vare hårt arbete och skicklighet
2 Worry/ anxiety	While flying at night, I worry about not seeing navigation landmarks and getting lost	When operating on high-energy injuries, I worry about not being able to identify landmarks and getting lost	När jag opererar jourfall oroar jag mig för att inte kunna känna igen anatomin och hamna fel
3 Worry/ anxiety	If I fly over water, I worry about having to ditch if the engine quits	If my operation is dependent on a specific instrument functioning, I worry about having to complete the operation if that instrument fails	Jag oroar jag mig för att det ska saknas specialinstrument, som visar sig behövas under operationens gång
4 Self-confidence	I can learn any flying skill if I put my mind to it	I can learn any surgical skill if I put my mind to it	Jag kan lära mig alla typer av operationer om jag bestämmer mig för det
5 Macho	I like to practice stalls	I like to do challenging procedures	Jag tycker om tekniskt svåra operationer
6 Impulsive	I really hate being delayed when I fly on a trip	I really hate having my cases delayed	Jag avskyr att vänta på att få operera
7 Macho	I like to practice unusual aircraft attitudes	I like to do challenging operations	Jag gillar ovanliga implantat.
8 Worry/ anxiety	I really worry about having to make an emergency landing	I really worry about having to abort a surgical procedure	Jag oroar mig över att bli tvungen att avbryta en operation
9 Impulsive	If the weather is marginal, I don't mind waiting at the airport until it clears up	If the patient's medical condition is questionable, I don't mind waiting for anesthesia to "line up" the patient	Om patientens hälsotillstånd är osäkert har jag inget emot att vänta tills narkosläkaren har optimerat patienten
10 Worry/ anxiety	I always worry about an accident when I am flying	I always worry about technical errors and complications when operating	Jag oroar mig ofta för att hamna i en situation under operationen som jag inte kan lösa
11 Impulsive	I am basically an impatient pilot	I am basically an impatient surgeon	I grunden är jag en otålig kirurg
12 Macho	I like to practice spins	I like high-risk operations	Jag tycker om utmaningen i en högriskoperation
13 Anti-authority	The FAA is more concerned with restricting access to aviation than providing the services aviation needs	The OR administration is more concerned with restricting access to the OR than providing the services when needed	Operationspersonalen är mer angelägen om att följa rutiner än att leverera de instrument jag behöver
14 Resignation/ <sup>a</sup>	Sometimes I feel that I have very little control over what happens to the aircraft	Sometimes I feel that I have very little control over what happens to the patient	Ibland känner jag att jag har väldigt lite kontroll över operationsförloppet
15 Resignation/ <sup>a</sup>	In a tight situation, I trust to fate	In a tight situation, I trust to fate	I en pressad situation lutar jag på turen
16 Worry/ anxiety	I really worry about mid-air collisions	I really worry about needlestick injuries	Jag oroar mig för allvarliga narkoskomplikationer
17 Resignation/ <sup>a</sup>	Sometimes I feel like the airplane has a mind of its own	Sometimes I feel that the patient's outcome is pre-set even before I start	Ibland känner det som att operationsresultatet är förutbestämt
18 Impulsive	If I want to fly somewhere, I want to do it now	If I decide to operate on someone, I want to do it now	Om jag bestämmer att någon behöver opereras så vill jag göra det direkt
19 Self-confidence	The thoroughness of my preflight mostly determines the likelihood of my having mechanical trouble with the aircraft	The thoroughness of my preoperative plan mostly determines the likelihood of my having a problem during the case	Min omsorgsfulla preoperativa planering minskar risken för perioperativa problem
20 Anti-authority	Air traffic control is more of a hindrance than a help	The OR scheduling desk is more of a hindrance than a help	Operationskoordinatören är mera ett hinder än till hjälp
21 Resignation/ <sup>a</sup>	When I'm in a tough spot, I figure if I make it, I make it, and if I don't, I don't	When I'm in a tough spot, I figure that if I make it, I make it, and if I don't, I don't	I en svår operationssituation tänker jag att det får gå som det går
22 Macho	I like to practice steep turns	I like to do difficult procedures	Det är roligt att operera fort
23 Impulsive	If you want to protest a license suspension by the FAA, the odds are stacked against you	If you want to protest a license suspension by the state medical licensing authority, the odds are stacked against you	Om någon ifrågasätter mina operationsindikationer blir jag förbannad
24 Anti-authority	The FAA is more of a hindrance than a help	The OR scheduling desk is more of a hindrance than a help	Startkontrollen är ett administrativt påhitt utan större värde
25 Resignation/ <sup>a</sup>	In flying, what will be, will be	In surgery, what will be, will be	Börjar en operation gå illa så blir det ofta värre
26 Anti-authority	In general, I find ATC to be very helpful	In general, I find the OR scheduling desk to be very helpful	Patientsäkerhetsarbetet har gjort mina operationer säkrare
27 Self-confidence	If I have done something illegal while flying, I will report it myself because I figure someone will report it anyway	If I have done something wrong in the OR, I will report it because someone will report me anyway	Om jag har gjort en dålig operation är jag öppen med det, eftersom det ändå kommer ut
28 Self-confidence	A successful flight is solely due to good planning and good execution	A successful surgery is solely due to good planning and good execution	En framgångsrik operation beror enbart på god planering och gott genomförande
29 Anti-authority	Most FAA regulations do not promote safety	Most OR administration rules do not promote safety	De flesta regler på opsalen främjar inte patientsäkerheten
30 Macho	I like to practice unusual attitudes in flying	I like to do unusual procedures	Jag gillar ovanliga operationer

<sup>a</sup> external locus of control; <sup>b</sup> Kadzielski et al. 2015.