Body Fluid Exposure

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Today

- Review of BFE
- Analysis of our database

Exposure to bodily fluid

Sharp injuries

Needlestick injury

…

Risks

- Infections
  - HBV, HIV, HCV
  - Several others HTLV, malaria, Ebola, YF, …

BMJ 2015;351:h3733

- Physical trauma
- Psychological trauma

Occup Med (Lond) 2013;63:260

Seroconversion

- HBV: ~0 - 30%
  - None in the UK
- HCV: 3%
  - 9 in the UK (2004 – 2013)
- HIV: 0.1 -0.3%
  - None since 1997

Eye of the Needle, UK PHE: 2014

Epidemiology

Med Dev 2017;10: 225

- Anyone
  - Under-reporting
- Anywhere
- Too many

N Engl J Med 2007;356:2693

Risk factors

Int J Occup Env Heal 2004;10:451

- Engineering
- Organisational
- Behavioural

Risk factors		Number of needlestick injuries <3 times (n=1071)	≥3 times (n=1085)	Crude OR (95% CI)	Adj OR (95% CI)
Duration of working	<15 year	423 (39.5%)	611 (56.3%)	1.97 (1.66 to 2.34)	2.19 (1.81 to 2.66)
	>15 year	648 (60.5%)	474 (43.5%)	1	1
Sex	Male	534 (49.9%)	467 (43.0%)	1	1
	Female	537 (50.1%)	618 (57.0%)	1.32 (1.11 to 1.56)	1.89 (1.56 to 2.29)
Occupation	Medical	691 (64.5%)	504 (46.5%)	1	1
	Para-medical	380 (35.5%)	581 (53.5%)	2.10 (1.76 to 2.49)	1.49 (1.03 to 2.15)
Ward	Medical	674 (62.9%)	333 (30.7%)	1	1
	Surgical	397 (37.1%)	752 (69.3%)	3.83 (3.21 to 4.59)	4.11 (1.71 to 9.88)
Number of night shifts/month	≤2	543 (50.7%)	464 (42.8%)	1	1
	>2	528 (49.3%)	621 (57.2%)	1.38 (1.16 to 1.63)	1.75 (1.28 to 2.39)
Educational sessions	Present	616 (57.5%)	455 (41.9%)	1	1
	Absent	455 (42.5%)	630 (58.1%)	1.87 (1.58 to 2.22)	1.99 (1.45 to 2.73)
Hospital policies	Present	562 (52.5%)	507 (46.7%)	1	1
	Absent	509 (47.5%)	578 (53.3%)	1.26 (1.06 to 1.49)	2.23 (1.99 to 2.49)
Universal precautions	Present	573 (53.5%)	525 (48.4%)	1	1
	Absent	498 (46.5%)	560 (51.6%)	1.23 (1.04 to 1.45)	1.66 (1.10 to 2.50)
Recapping the needle	Yes	384 (35.9%)	667 (61.5%)	2.85 (2.40 to 3.40)	2.63 (2.12 to 3.26)
	No	687 (64.1%)	418 (38.5%)	1	1
Method of recapping		n=384	n=667		
	One hand	214 (55.7%)	274 (41.1%)	1	1
	Two hands	170 (44.3%)	393 (58.9%)	1.81 (1.40 to 2.33)	3.08 (2.04 to 4.65)
Protective clothes	Yes	560 (52.3%)	497 (45.8%)	1	1
	No	511 (47.7%)	588 (54.2%)	1.30 (1.09 to 1.54)	1.39 (1.04 to 1.85)
Working hours	≤8	430 (40.1%)	246 (22.7%)	1	1
	>8–12	398 (37.2%)	482 (44.4%)	2.12 (1.72 to 2.60)	2.14 (1.34 to 3.44)
	>12	243 (22.7%)	357 (32.9%)	2.57 (2.05 to 3.22)	2.28 (1.17 to 4.44)

Ijoem 2018;9(4):63

Management of BFE

Risk assessment, Exposure

- Injury
  - Percutaneous
  - Mucocutaneous
- Fluid
  - Blood
  - Others

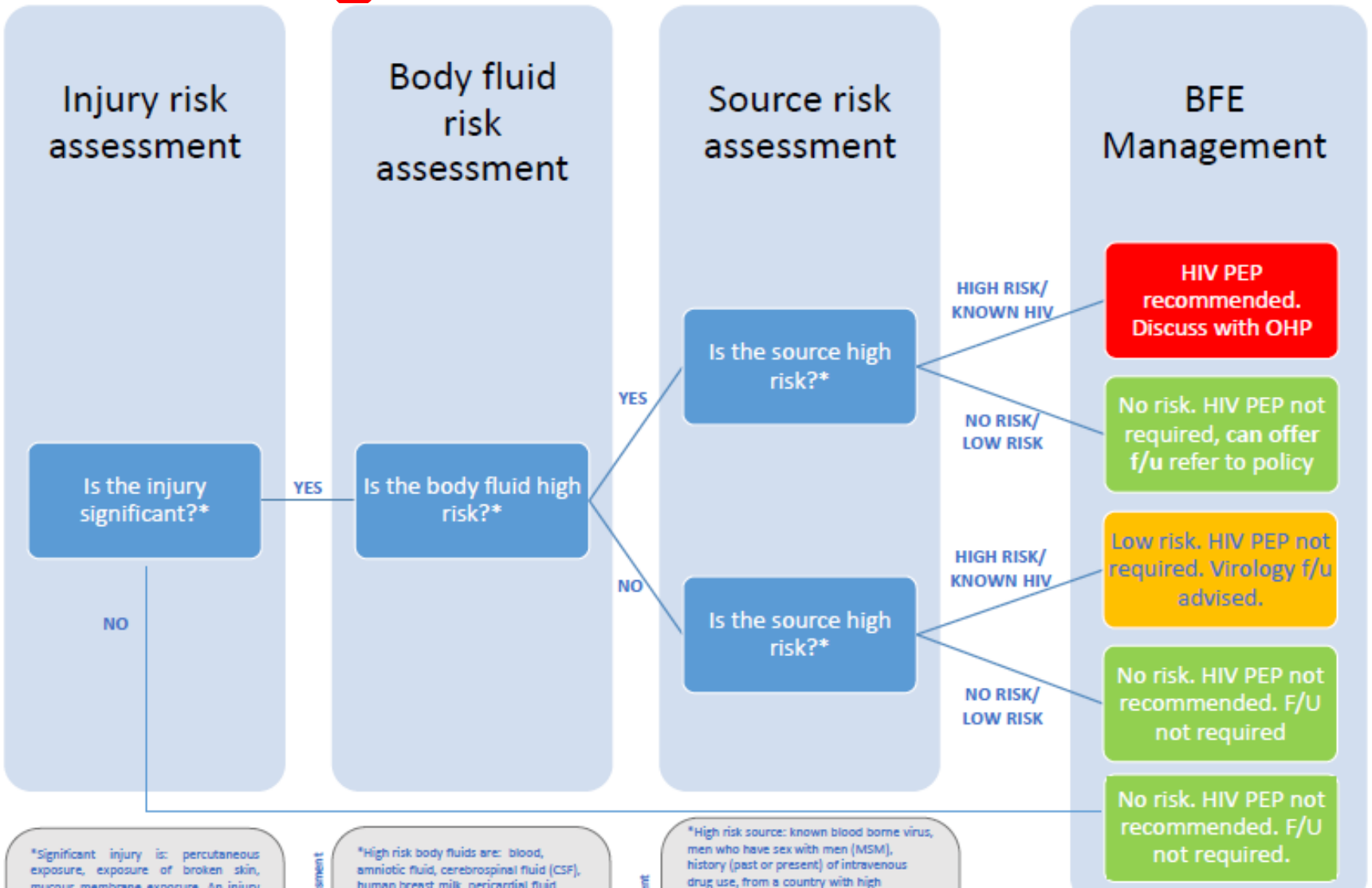
Significant Injury x Significant Fluid = Significant Exposure

Risk assessment, Source

- Known
- High risk
  - MSM
    - Epidemiology; HIV in UK 6%, London = 13.5%
  - PWID; HIV ~1 – 2 %, HCV 50%
  - High prevalence areas

Known OR High Risk Source

Significant Exposure x High Risk Source = High Risk Accident



Risk management

- Immediate actions
- Reporting
- Based on the risk assessment
  - Serum save
  - HBV Booster
  - Post Exposure Prophylaxis (PEP) treatment for high risk accidents
  - Follow up for low risk and high risk accidents

HIV PEP

- Truvada® (Tenofovir Disoproxil 245mg + Emtricitabine 200mg)1 tablet O.D.
- Raltegravir® 400mg 1 tablet b.d.
- 28 days
- Pre-PEP assessment
- Side effects
- On PEP Monitoring

HBV PEP

- HBIG, 500 u, IM, 1x or 2x

HCV

- No PEP
- Treatment of acute HCV

Virologic follow up

- High risk
  - 6, 12, 24 weeks
- Low risk
  - 12, 24 weeks

Analysis of our data

Focus on timing of the accident and shift

Basic

- Data collection
  - Demography, accident, contributing factors, actions
- Community, acute healthcare, HEI, law enforcement
- 2014 to 2019 (5 years)

Prevalence (per person, p.a.)

- 3723 BFE on healthcare including students
- 660 by medics/ dentists, ~132 pa

Job	Frequency	Percent	Annual prevalence
Dental Students	122	18.5	34%
Dentist	51	7.7	17%
Honorary	1	.2	-
Junior Dr	372	56.4	12%
Medical Students	54	8.2	2%
Senior Dr	60	9.1	2%
Total	660	100.0	6%

Demography

Sex	Frequency	Percent
Female	361	54.7
Male	299	45.3
Total	660	100.0

Age	
Mean	31.16
Median	29
Mode	29
STD	7.9
Min	18
Max	64

# Previous	Frequency	Percent
0	461	69.8
1	53	8.0
2	15	2.3
3	2	.3
4	2	.3
Total	533	80.8
Average	0.2	
NK	127	19.2
Total	660	100.0

Type of Exposure

	Frequency	Percent
NK	71	10.8
Bite	1	.2
Mix	2	.3
Mucocutaneous	23	3.5
Percutaneous	563	85.3
Total	660	100.0

Risk assessment and management

1st Aid	Frequency	Percent
Yes	609	92.3
No	51	7.7
Total	660	100.0

Accident Risk	Frequency	Percent
High	53	8.0
Low	588	89.1
Undetermined	19	2.9
Total	660	100.0

On PEP	Frequency	Percent
No	594	90
Yes	66	10
Total	660	100.0

No seroconversion

Contributing factors

PPE	Frequency	Percent
NK	93	14.1
Combined	58	8.8
Double Gloves	32	4.8
Mask	1	.2
Single Gloves	464	70.3
Visor	12	1.8
Total	660	100.0

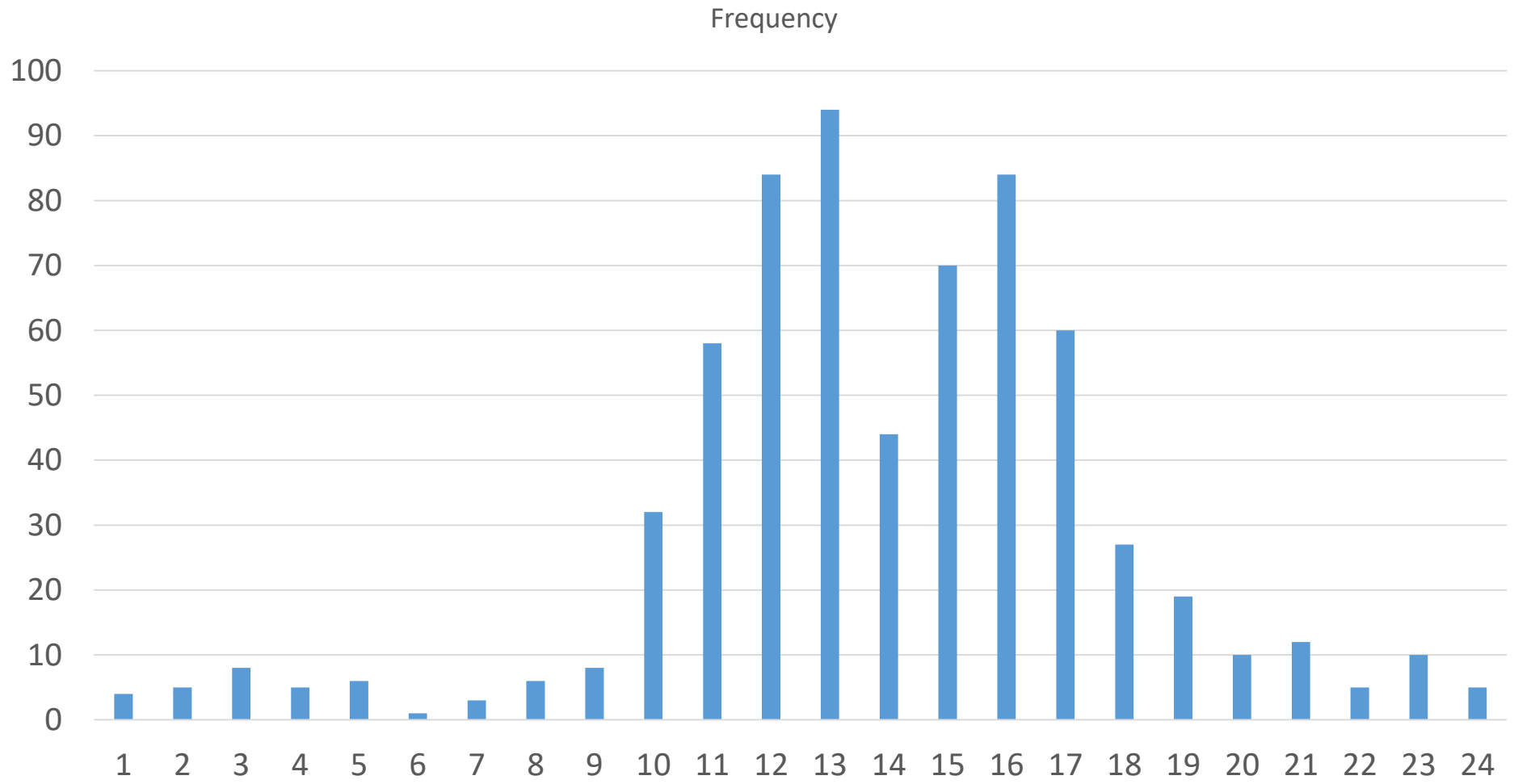
Appropriate PPE	Frequency	Percent
No	53	8
Yes	470	71.2
Total	660	100.0

Identified	Frequency	Percent
No	397	60.2
Yes	263	39.8
Total	660	100.0

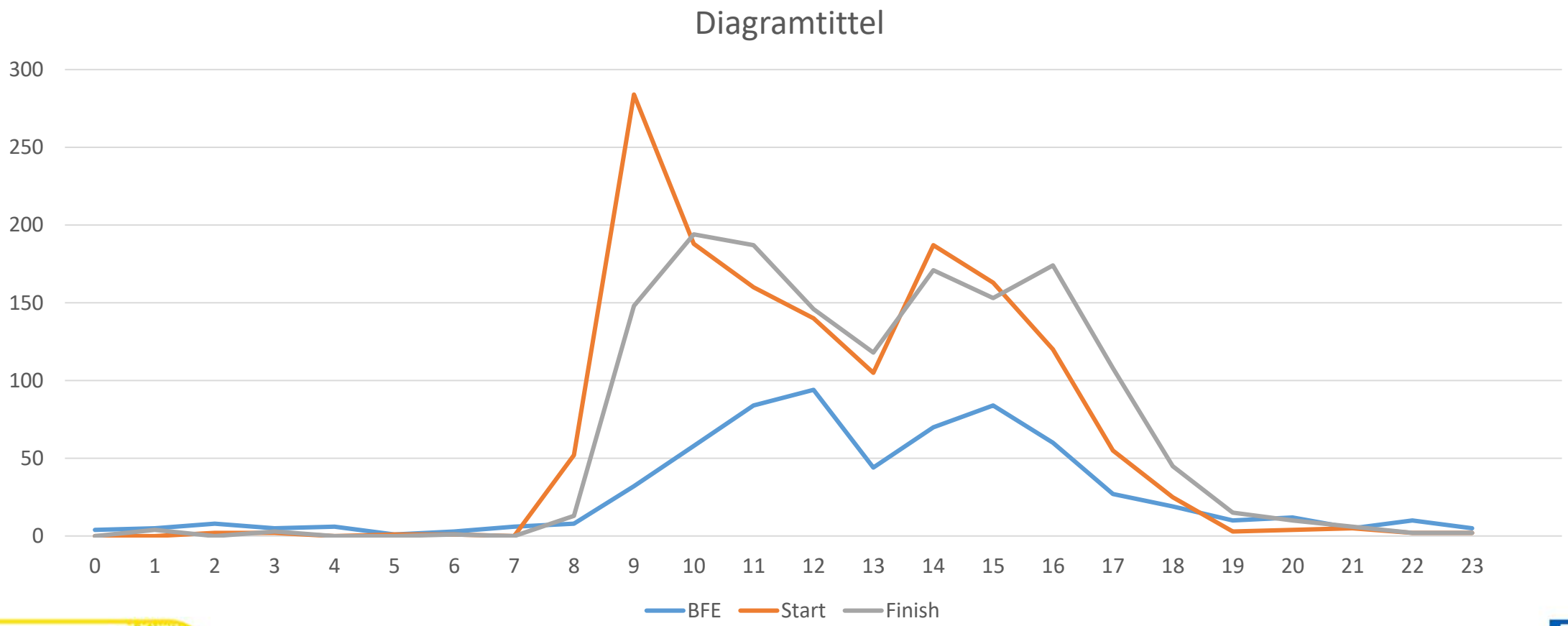
Avoidable	Frequency	Percent
Yes	254	38.5
No	281	42.6
NK	125	18.9
Total	660	100.0

Month	Frequency	Percent
JANUARY	71	10.8
FEBRUARY	48	7.3
MARCH	47	7.1
APRIL	51	7.7
MAY	51	7.7
JUNE	62	9.4
JULY	51	7.7
AUGUST	52	7.9
SEPTEMBER	61	9.2
OCTOBER	68	10.3
NOVEMBER	60	9.1
DECEMBER	38	5.8
Total	660	100.0

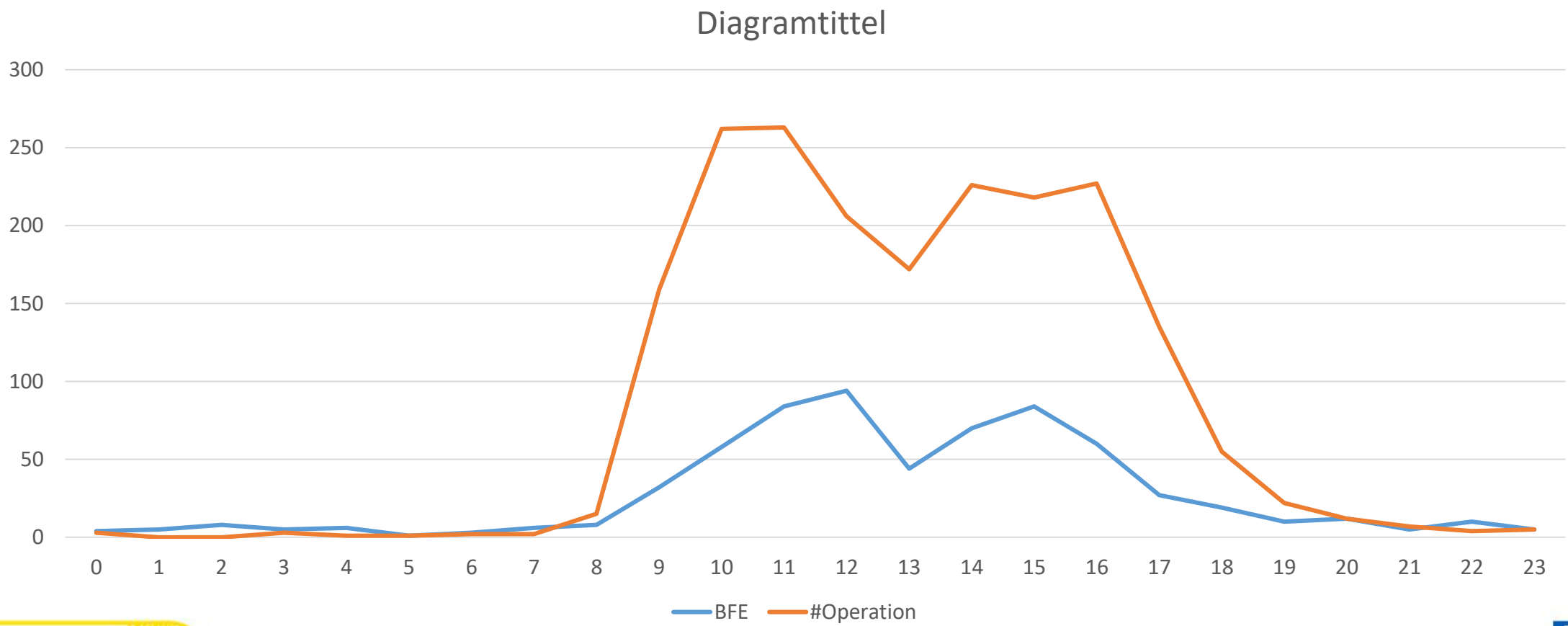
#BFE per hour of the day



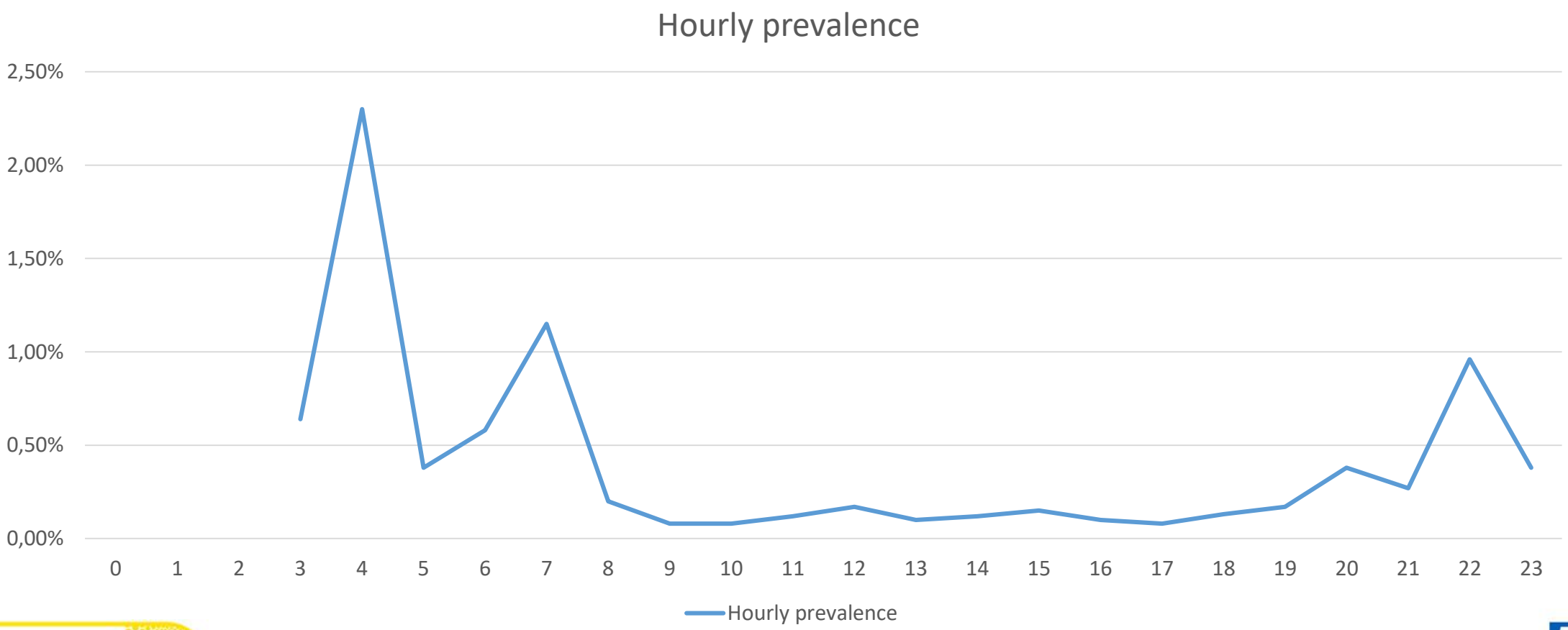
Hours vs Start & Finish of Surgeries



Hours vs # of Surgeries per Hour



Hourly Prevalence of BFE per Surgery



Timing, other

When in the procedure	Frequency	Percent
NK	32	4.8
Before	9	1.4
During	427	71.5
After	147	22.3
Total	660	100.0

When in the shift	Frequency	Percent
NK	39	5.9
Start	116	17.6
Middle	336	50.9
End	169	25.6
Total	660	100.0

When in shift vs. Avoidable Chi Sq, p=0.000

	When during shift			
Avoidable	Start	Middle	End	Total
No	56	151	70	281
Yes	44	132	76	254
%Yes	17.32%	51.97%	29.92%	100.00%
%Total	17.58%	50.91%	25.61%	100.00%
ODD	0.79	0.87	1.09	
OR	1	1.12	1.39	

When in shift vs. PPE, Chi Sq, p=0.000

	When during shift			
Appropriate PPE	Start	Middle	End	Total
No	12	26	13	53
%No	22.64%	49.06%	24.53%	100.00%
Yes	87	247	126	470
%Total	17.58%	50.91%	25.61%	100.00%
ODD	0.14	0.11	0.10	
OR	1	0.75	0.74	

Type of shift vs. Avoidable, Chi Sq, p=0.007

	Type of shift			
Avoidable	Day	Twilight	Night	Total
No	250	24	7	281
Yes	219	23	12	254
%Yes	86.22%	9.06%	4.72%	100.00%
%Total	86.36%	8.48%	5.15%	100.00%
ODD	0.88	0.96	1.71	
OR	1	1.09	1.95	

Conclusion

- Dental >> Medical
- Juniors >> Seniors
- Male ~ Female
- Percutaneous >> the rest

Conclusion

- 39% Avoidable, 8% no appropriate PPE
- January and October, more prevalent
- More likely late night and early morning
- More avoidable towards the end of the shift
- More avoidable in nights

Strengths & Weaknesses

Strengths

- Large sample
- Objective assessments
- Per procedure

Weaknesses

- Assumptions
- Surgery as surrogate for procedure

Thanks you
Questions?

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