Can we help to prevent antibiotic resistance in the community?

An audit on antibiotic use in a GOPC in Kowloon East Cluster

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Kowloon East Cluster

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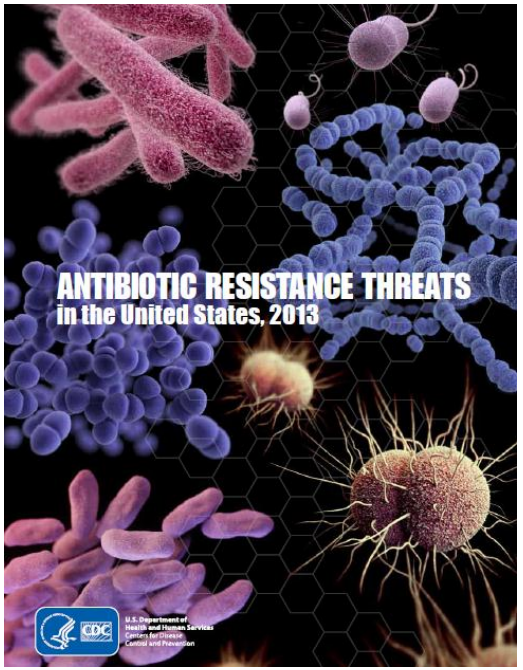
Antibiotic resistance

- Worldwide health threat
- Cause greater morbidity or even mortality
- Add considerable costs to heath care system
- CDC, United States 2013

Antibiotic resistance related health issues	Unit(s) / year (estimated)
No. of illnesses	2,049,442
No. of death	23,000
Excess health costs	US$ 20 billion



伊院VRE擴散 瑪麗

【本報訊】爆發抗萬古霉素腸道鏈球菌（VRE）的伊利沙伯醫院，前日起進行全院篩查，希望及早控制惡菌。不過據悉，VRE已悄悄由伊院擴散至其他公立醫院，如瑪麗醫院曾接獲來自伊院的VRE帶菌者。有微生物學家表示，若伊院未能控制VRE，會產生骨牌效應，令老人院舍及其他醫院爆發，「到時就玩完」。

有微生物學家表示，按以往經驗，醫院的VRE主要由曾到海外或現帶VRE的港人，曾在內地入醫院，相信在內地醫院感染。內地農業濫用抗生素，令VRE爆發嚴重。

五年後情況或失控

而若伊院不能控制爆發，VRE繼續在該院傳播，之後傳到安老院，再傳到其他醫院，5至6年後會失控。事實上，伊院的VRE已悄悄擴散至其他醫院，瑪麗醫院曾接獲來自伊院的VRE帶菌者，與伊院同一聯網的九龍醫院也中招。伊院以

廣華再1人證染抗

香港文匯報訊（記者　郭兆東）廣華

示，對於早前內科病房有病人證實為抗菌帶菌者，院方按既定感染控制程序，病人，再證實有一名81歲男病人為帶菌感染病徵，現時仍然留醫，並接受進一況穩定。

發言人表示，院方會落實加強執行施，包括加強病房消毒及清潔，並嚴格措施，包括為抗萬古霉素腸道鏈球菌帶儀器、加強手部清潔。院方亦已把有關及衛生防護中心作出跟進，並會繼續密況。

抗藥惡菌肆虐社區

金黃葡萄球菌來勢兇猛

【新報訊】衛生防護中心的統計顯示，去年多種傳染病個案數目大增，其中，社區性抗藥性金黃葡萄球菌感染個案，較前年多近22%，更是2007年時的4倍多。手足口病方面，去年錄得779宗個案，比2012年上升一倍，爆發群體主要集中在幼稚園學童，其次為小學及中學生。

染
侵
年

社區散播　引發敗血症器官衰竭

抗藥惡菌　極速殺壯漢

防不勝防

「超級惡菌」罕見極速奪壯男性命。已在本地廣泛散播的社區抗藥性金黃葡萄球菌（CA-MRSA），去年呈報個案逼近千宗大關。衛生防護中心昨公布，一名三十九歲健康壯年男子，本月初出現發燒、咳嗽等感冒徵狀，兩日後惡化至需入住深切治療部，再留院兩日後因肺炎及敗血性休克不治。有傳染病專家指出，近年日本及本港出現毒性較強的CA-MRSA品種，冀當局加強監測。

■公立醫院環境擠迫，是抗藥惡菌最常孳生的地方。

疑遭惡菌奪命的男子居於東區，本身健康良好，本月六日起有發燒、咳嗽、流鼻水及喉嚨痛，兩日後留醫將軍澳醫院，同日轉送深切治療部。惟病情急速惡化，本月十日不治，死因為肺炎及敗血性休克。衛生防護中心化驗其痰液後，證實含CA-MRSA。男病人最近沒外遊紀錄，家人亦無相關病徵。

個案急增　上年近千宗

抗藥性金黃葡萄球菌是一種對多種抗生素呈抗藥性的惡菌，過往通常在用藥頻密的醫院內造成感染，但近年很多感染者為社區健康人士，病發前一年均無住院或接受醫療程序，故將這類個案稱為社區抗藥性金黃葡萄球菌感染，並相信由濫用抗生素造成。本港○七年起將CA-MRSA列作法定呈報傳染病，該年只有一百七十三宗個案，之後逐年飆升，去年有九百八十八宗。該惡菌多數只造成皮膚膿瘡，過去兩年分別有六宗及三宗死亡報告，當中僅三宗屬感染後死亡。

或先染流感 降抵抗力

港大感染及傳染病中心總監何栢良指，CA-MRSA的基因隨時間轉變。若過去從未接觸某品種惡菌，即使健康人士，一旦感染亦可十分嚴重。近期流感病毒仍活躍，不排除該死亡男子先感染流感，令免疫系統轉弱，於打噴嚏或者抹鼻涕時雙手接觸口鼻，惡菌藉此入侵呼吸道及肺部，繼而引發敗血症以及器官衰竭，處方可殺惡菌的抗生素亦未能救命。

他又指，本港流行的CA-MRSA以「ST39」及「ST50」兩品種為主。但港大及日本專家近年發現，兩地均出現毒性較強的「ST8」惡菌。現時若有感染CA-MRSA後死亡的不尋常個案，港大會嘗試追查惡菌品種，但長遠應由衛生防護中心作有系統的恒常監測。

■社區抗藥性金黃葡萄球菌，一旦入血，可致敗血症及器官衰竭。

社區抗藥性金黃葡萄球菌統計

年份	感染個案	死亡個案*
2012	813	6（2）
2013	988	3（1）
2014（截至3月19日）	160	1

*註：括號內為因感染社區抗藥性金黃葡萄球菌死亡，最新公布39歲男子個案尚待調查

資料來源：衛生防護中心

醫健版

全無病徵已出院 正聯絡父母解釋

瑪嘉烈14嬰染抗藥惡菌

瑪嘉烈醫院初生嬰兒病房爆發「惡菌」抗藥性金黃葡萄球菌，十四名新生嬰兒中招，全部變帶菌者，沒有病徵，已出院，院方正聯絡相關嬰兒的父母解釋。醫管局醫生指，抗藥性金黃葡萄球菌可透過接觸感染，初生嬰兒抵抗力弱風險大，病發感染風險較高，而病人出院後在沒有抗生素環境下，體內病菌

消失。

瑪嘉烈醫院昨公布，院方早在本月七日和八日，先後於篩查中發現兩名新生嬰兒為抗藥性金黃葡萄球菌帶菌者，其後於本月十三日起，為該初生嬰兒病房及產後病房的新生嬰兒加強篩查，再確定多十二名新生嬰兒為抗藥性金黃葡萄球菌帶菌者，全部人均無出現感染病徵，並已出院。

首帶菌者疑母體感染

醫管局總感染控制主任曾艾壯解釋，抗藥性金黃葡萄球菌主要透過環境接觸傳播，例如接觸皮膚、共用醫療儀器等，相信第一個帶菌者可能從母體染得惡菌，醫護人員其後處理該嬰兒時，再將病菌傳播開去，導致多名嬰兒帶菌。

他說，帶菌者如沒受感染，就不會出過初生嬰兒免疫系統未完全成熟，細菌容感染，例如皮膚發炎，細菌入血、入肺等況下，病人離開醫院，在沒有抗生素環境周，細菌就會消失。他又指，醫院內感染黃葡萄球菌引發炎症機會較低，因不像社金黃葡萄球菌帶有PVL基因，該基因有較力。

瑪嘉烈醫院已在有關病房加強消毒及專用的嬰兒護理用具，以防交叉感染；提高交叉感染風險程序時加倍注意，以及嚴醫護人員和產婦遵從手部衛生，又將有關管局及衛生防護中心。

社區抗藥金球菌　閃殺居家女病人

【本報訊】本港接連有病人感染社區抗藥性金黃葡萄球菌（CA-MRSA）後死亡，以往每年僅一至兩宗，今年情況罕見。最新一宗死亡個案為有長期病患的廿七歲女子，本月初在家中暈倒，送院後證實不治。微生物專家認為，病人未及向醫生求診，病情突然惡化至死亡，情況值得關注，需了解確實死亡原因，更要提醒長期病患者注意個人衛生。

27歲送院亡 腎血含菌

女死者原住油尖旺區，本月九日被發現在家中昏迷，送往廣華醫院後證實死亡。血液和腎臟膿液樣本經化驗後，均證實含抗藥惡菌CA-MRSA。衛生防護中心初步調查發現，患者最近沒有外遊，家居接觸者都沒有病徵。個案已轉交死因裁判法庭跟進。

香港大學感染及傳染病中心總監何栢良指出，CA-MRSA已在社區廣泛傳播，長期病患者接觸受污染的環境，容易出現入侵性感染。該菌入血後，隨血液入侵全身器官。相信女死者因惡菌入血，再攻擊她的腎臟，令血液和腎臟膿液均含菌。

他認為，正常情況下，廿多歲年輕病人若感到不適，應會主動求診，但女死者未及見醫生即在家中昏倒，顯示病情急速惡化外，她的自我照顧能力亦可能有問題，情況值得關注。

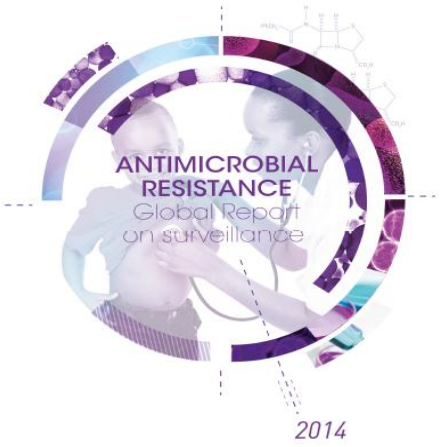
本港CA-MRSA個案近年不斷增加，二○一二年有八百一十三宗，去年升至九百八十八宗，今年截至本月廿四日已有一百七十一宗。一二及一三年共三宗因直接感染CA-MRSA後死亡個案，今年已有兩宗，首宗為卅九歲壯健男子本月十日不治，衛生防護中心本月廿日公布化驗結果。

瑪麗12嬰帶惡菌無病徵

另外，瑪嘉烈醫院特別嬰兒護理病房爆發抗藥性金黃葡萄球菌（MRSA）。本月七日至八日，最先發現兩名初生嬰兒帶菌，本月十三日起篩查該病房和產後病房初生嬰，再確定十二名初生嬰帶菌，全部沒出現感染病徵，並已出院。據悉，初生嬰不會「走動」，最大可能是照顧嬰兒的醫護人員疏忽感染控制措施，將惡菌傳開。該院正陸續聯絡嬰兒父母解釋情況，以及加強病房感染控制措施。

Antibiotic resistance and primary care

- Proper use of antibiotic is of upmost importance in reducing antibiotic resistance
- Unnecessary antibiotics use ➡ ⬆ adverse effect
- Majority of antibiotic use by human beings is from primary care
- Meta-analysis, 2010
  - Antibiotics use in primary care were associated with resistance of urinary and respiratory infections
- WHO, 2014
  - Very high rates of bacterial resistance in common community acquired infections



The audit

- Objectives
  1. To evaluate the appropriateness of antibiotic use in the clinic
  2. To implement strategies to enhance rational use of antibiotic in the clinic

Methodology (1)

- 1st audit cycle period
  - 1st Apr 2013 to 30th Jun 2013
- Medical records of all patients being prescribed with oral antibiotics were reviewed for appropriateness of antibiotic use
- Appropriate antibiotic use is defined as:
  - Prescribing antibiotic with correct indication, choice, dosing and duration
  - According to updated local and international guidelines

Methodology (2)

- Areas of enhancement were identified
- Improvement strategies implemented to intensify training on antibiotic use for trainees:
  - Holding educational seminar
  - Preparing and uploading updated and evidence-based clinical guidelines to Department Website
  - Periodic medical record review
  - Providing feedbacks and advices on enquires

Recommendations for the oral antibiotics of common infections in KEC GOPCs (Adults)

Version	Effective date
01	1 September 2013

Document number	KEC-FMP-GL-037-V01
Author	Dr. Lai Kit Ping Loretta, Dr. Chan Pang Fai
Custodian	COS (FM&PHC)
Approved by	GOPC and Community Service Subcommittee
Approval date	1 September 2013

C. Respiratory tract infections

Sub-type	1st choice	Alternative	Duration	Remarks
1. Acute bronchitis				
Indications of bacterial infection: Presence of purulent sputum, fever, crackles and systemically unwell, radiological evidence of chest infection Usual bacterial organisms: *Bordatella pertusis, M.pneumoniae, C. pneumoniae, S. pneumoniae*				
	If suspected bacterial infection: **Amoxicillin-clavulanate 375mg TDS** *If pertussis is suspected or confirmed:* **Clarithromycin 500mg BD**	*If penicillin allergy:* **Clarithromycin 500mg BD** *If pertussis is suspected or confirmed and with macrolide allergy:* **Cotrimoxazole 960mg BD**	**5 days** **14 days**	For other details, refer to URI guidelines uploaded to Department website
2. Community acquired pneumonia				
Usual organisms: *S. pneumoniae, H. influenzae, M. pneumoniae, C. pneumoniae, C. psittaci (influenza A, M. tuberculosis)*				
	Amoxicillin-clavulanate 375mg TDS and **Amoxicillin 250mg TDS** *If atypical pneumonia is suspected:* add **Clarithromycin 500mg BD**	*If penicillin allergy:* **Levofloxacin 500mg daily**	**7 days**	Review 48 hours or earlier and refer hospital if indicated.
4. Acute bacterial exacerbation of COPD				
Usual organisms: Respiratory viruses, S. pneumoniae, H. influenzae, M. catarrhalis				
	Amoxicillin-clavulanate 375mg TDS	*If penicillin allergy:* **Clarithromycin 500mg BD** or **Levofloxacin 500mg daily**	**7 days**	For other details, refer to COPD guidelines uploaded to Dept website
5. Acute bacterial exacerbation or pneumonia in patient with bronchiectasis				
Usual organisms: *P. aeruginosa H. influenzae, M. catarrhalis, S. pneumoniae*				
	Ciprofloxacin 500mg BD	**Levofloxacin 500mg daily**	**7 days**	

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	Amoxicillin-clavulanate 375mg TDS and **Amoxicillin 250mg TDS** *If atypical pneumonia is suspected:* add **Clarithromycin 500mg BD**	*If penicillin allergy:* **Levofloxacin 500mg daily**	**7 days**	Review 48 hours or earlier and refer hospital if indicated.
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	Ciprofloxacin 500mg BD	**Levofloxacin 500mg daily**	**7 days**	

C. Respiratory tract infections

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5. Acute bacterial exacerbation or pneumonia in patient with bronchiectasis Usual organisms: *P. aeruginosa H. influenzae, M. catarrhalis, S. pneumoniae*				
	Ciprofloxacin 500mg BD	**Levofloxacin 500mg daily**	**7 days**	

Recommendations for the oral antibiotics of common infections in KEC GOPCs (Children)

Version	Effective date
01	1 September 2013

Document number	KEC-FMP-GL-038-V01
Author	Dr. Lai Kit Ping Loretta, Dr. Chan Pang Fai
Custodian	COS
Approved by	GOPC and Community Service Subcommittee
Approval date	1 September 2013

A. Skin and soft tissue infections				
Sub-type	**1st choice**	**Alternative**	**Duration**	**Remarks**
1. Cellulitis or erysipelas Usual organisms: *Groups A, B, C, G streptococci (± S. aureus)*				
	Amoxicillin-clavulanate	**Amoxicillin** (Double dose in severe infection) and **Flucloxacillin** *If penicillin allergy:* **Erythromycin** (Double dose in severe infection) or **Clarithromycin**	**7 days**	
2. Impetigo Usual organisms: primarily caused by *S. aureus*, and sometimes by *S. pyogenes*				
	Flucloxacillin *If streptococci suspected in severe infection:* add **Penicillin V**	*If penicillin allergy:* **Erythromycin** (Double dose in severe infection) or **Clarithromycin**	**7 days**	
3. Infected leg ulcers Culture swabs and antibiotics are only indicated when there is evidence of clinical infection such as inflammation/ redness/ cellulitis; increased pain; purulent exudate; rapid deterioration of ulcer or pyrexia				
	Amoxicillin-clavulanate	*If penicillin allergy:* **Erythromycin** (Double dose in severe infection) or **Clarithromycin**	**7 days then review**	

E. Ear, nose, oropharynx infections (continued)				
Type	**1st choice**	**Alternative**	**Duration**	**Remarks**
4. Chronic sinusitis Usual organisms: *S. pneumoniae, H. influenzae, M. catarrhalis, S. aureus, Coagulase –ve staphylococcus, anaerobes*				
				Refer to ENT is indicated
5. Acute otitis media Usual organisms: *S. pneumoniae, H. influenzae, M. catarrhalis*				
	Amoxicillin 80-90mg/kg/day in 3 divided dose (max 1.5g/day)	**Amoxicillin-clavulanate** *and* **Amoxicillin** (to a total dose 80-90mg/kg/day)	**< 6 yrs or severe disease: 10 days** **mild to moderate disease: 5-7 days**	For other details, refer to URI guidelines uploaded to Department website
		If penicillin allergy: **Clarithromycin** or **Azithromycin**	**5-7 days**	
6. Acute cervical lymphadenitis Usual organisms: *Viral, S. aureus, S. pyogenes (group A), Bartonellla, Mycobacterium*				
	Amoxicillin-clavulanate	*If penicillin allergy:* **Cefaclor** or **Cotrimoxazole**	**10-14 days**	

Antibiotics dosage for pediatric patients

Amoxicillin	
<7 days:	30mg/kg (max 62.5mg) BD
7-28 days:	30mg/kg (max 62.5mg) TDS
1 mo-1 yr:	62.5mg TDS
1-5 yrs:	125mg TDS
5-12 yrs:	250mg TDS

Amoxicillin-clavulanate (156mg/5ml)	
Neonate:	0.25ml/kg TDS
1 mo-1 yr:	0.25-0.5ml/kg TDS
1-6 yrs:	5-10ml TDS
6-12 yrs:	10-20ml TDS

Ampicillin	
<7 days:	30mg/kg (max 62.5mg) BD
7-21 days:	30mg/kg (max 62.5mg) TDS
21-28 days:	30mg/kg (max 62.5mg) QID
1mo-1 yr:	62.5mg QID
1-5 yrs:	125mg QID
5-12 yrs:	250mg QID

Azithromycin	
>6 mos:	10mg/Kg (max 500mg) daily or
15-25Kg:	200mg daily
26-35Kg:	300mg daily
36-45Kg:	400mg daily

Cefaclor	
1 mo-1 yr:	62.5-125mg TDS
1-5 yrs:	125-250mg TDS
>5 yrs:	250-500mg TDS

Clarithromycin	
<8 Kg:	7.5mg/Kg BD
8-11 Kg:	62.5mg BD
12-19 Kg:	125mg BD
20-29 Kg:	187.5mg BD
30-40 Kg:	250mg BD

Cotrimoxazole	
6 wks-5 mos:	120mg BD
6 mos-6yrs:	240mg BD
6-12 yrs:	480mg BD

Erythromycin	
Neonate:	12.5mg/Kg QID
1 mo-2 yrs:	125mg QID
2-8 yrs:	250mg QID
8-12 yrs:	250-500mg QID

Flucloxacillin	
<7 days:	25mg/kg BD
7-21 days:	25mg/kg TDS
21-28 days:	25mg/kg QID
1 mo-2 yrs:	62.5mg-125mg QID
2-10 yrs:	125-250mg QID
>10 yrs:	250-500mg QID

Metronidazole	
1-3 yrs:	50mg TDS
3-7 yrs:	100mg BD
7-10 yrs:	100mg TDS

Penicillin V	
	10-12.5mg/Kg QID or
<1 yr:	62.5mg QID
1-6 yrs:	125mg QID
6-12 yrs:	250mg QID

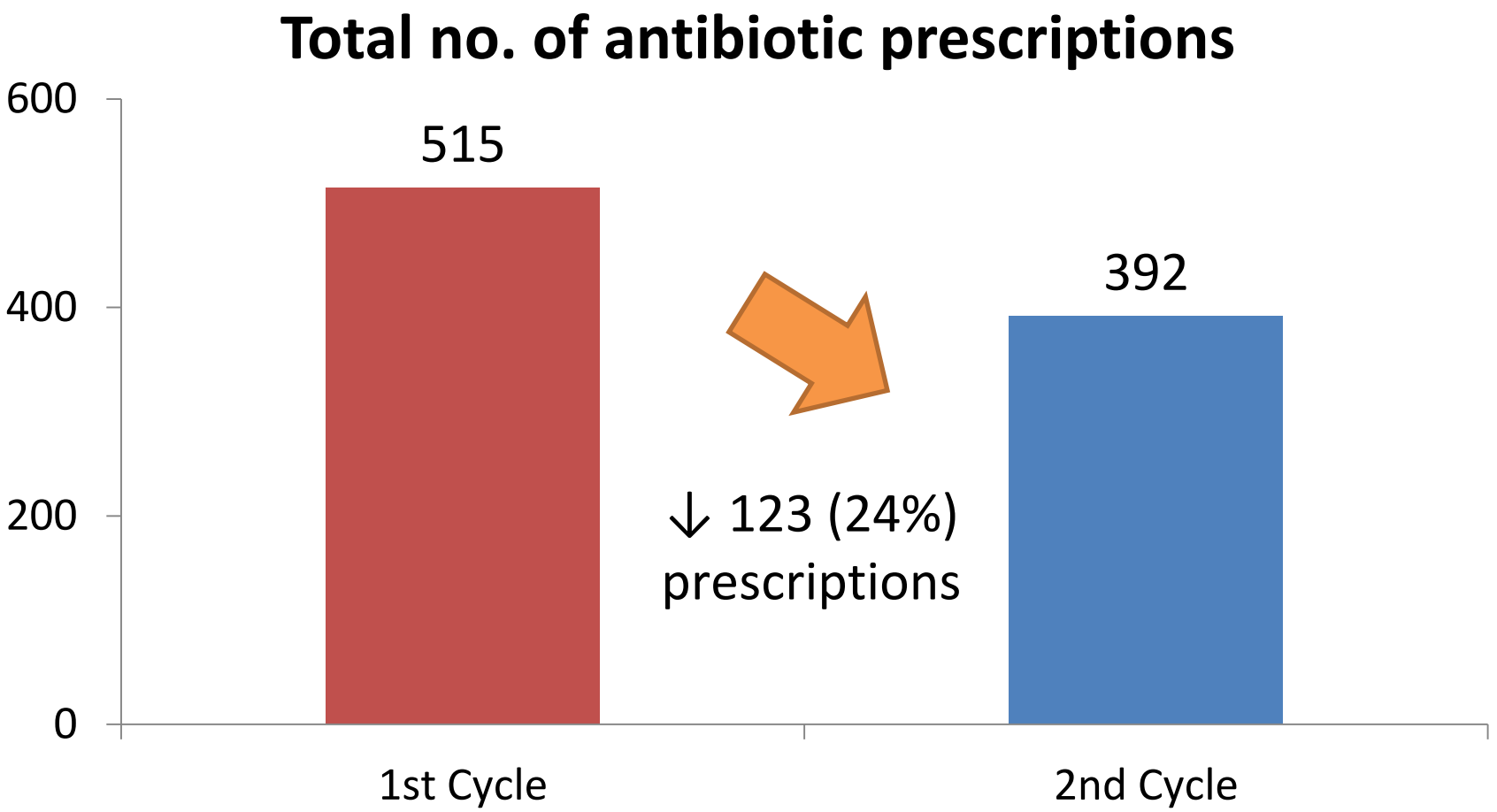
Methodology (3)

- 2nd audit cycle period
  - 1st Oct 2013 to 31th Dec 2013
- Medical records of all patients being prescribed with oral antibiotics were then reviewed again for appropriateness of antibiotic use

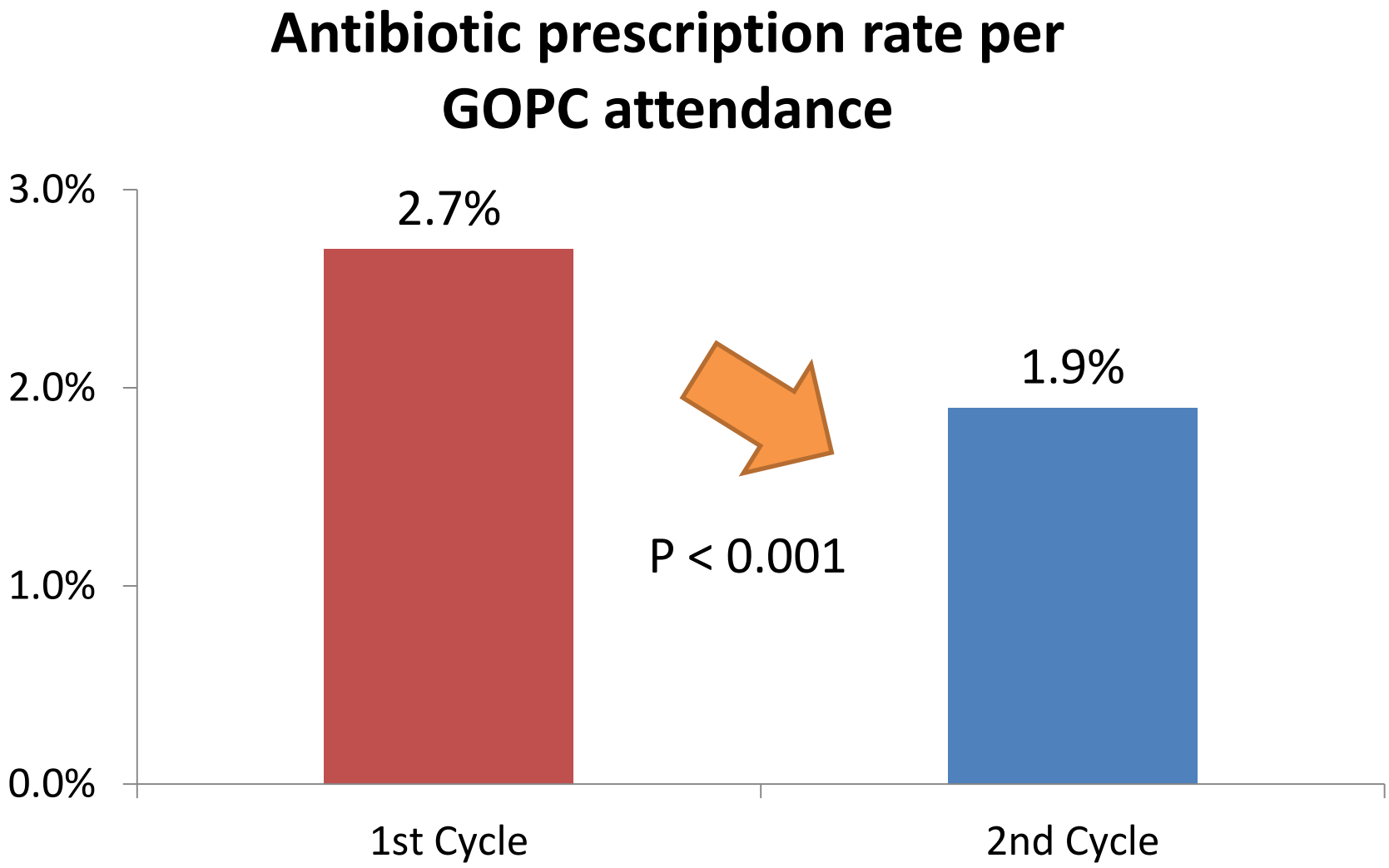
Results (1)

Patient Characteristics		1st Cycle	2nd Cycle	p value
Age (mean)		58.3	59.6	0.33
Age group	Adult	97%	98%	0.32
	Child (≤ age 12)	3 %	2%	
Sex	Male	40%	39%	0.62
	Female	60%	61%	

Results (2)

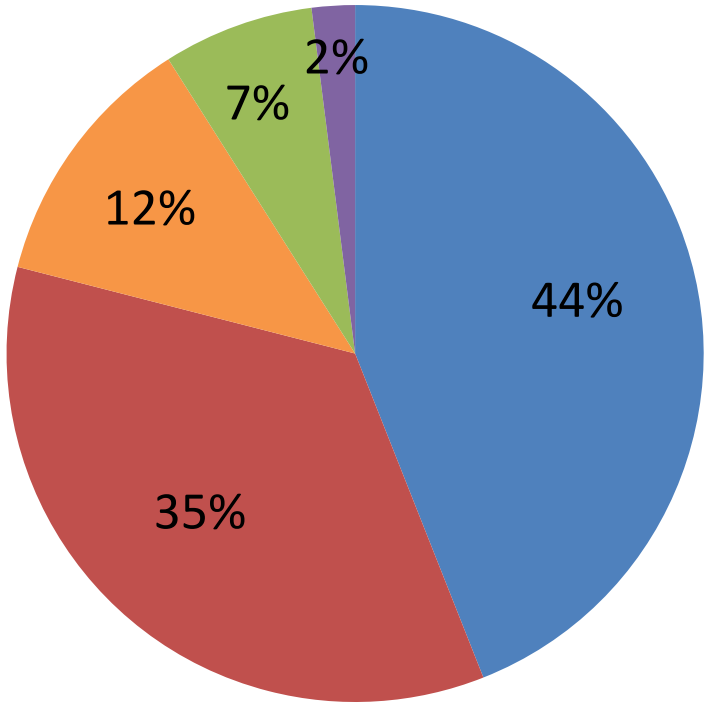

Total no. of antibiotic prescriptions
600
400
200
0
515
392
↓ 123 (24%) prescriptions
1st Cycle
2nd Cycle

Results (3)


Antibiotic prescription rate per GOPC attendance
3.0%
2.0%
1.0%
0.0%
2.7%
1.9%
P < 0.001
1st Cycle
2nd Cycle

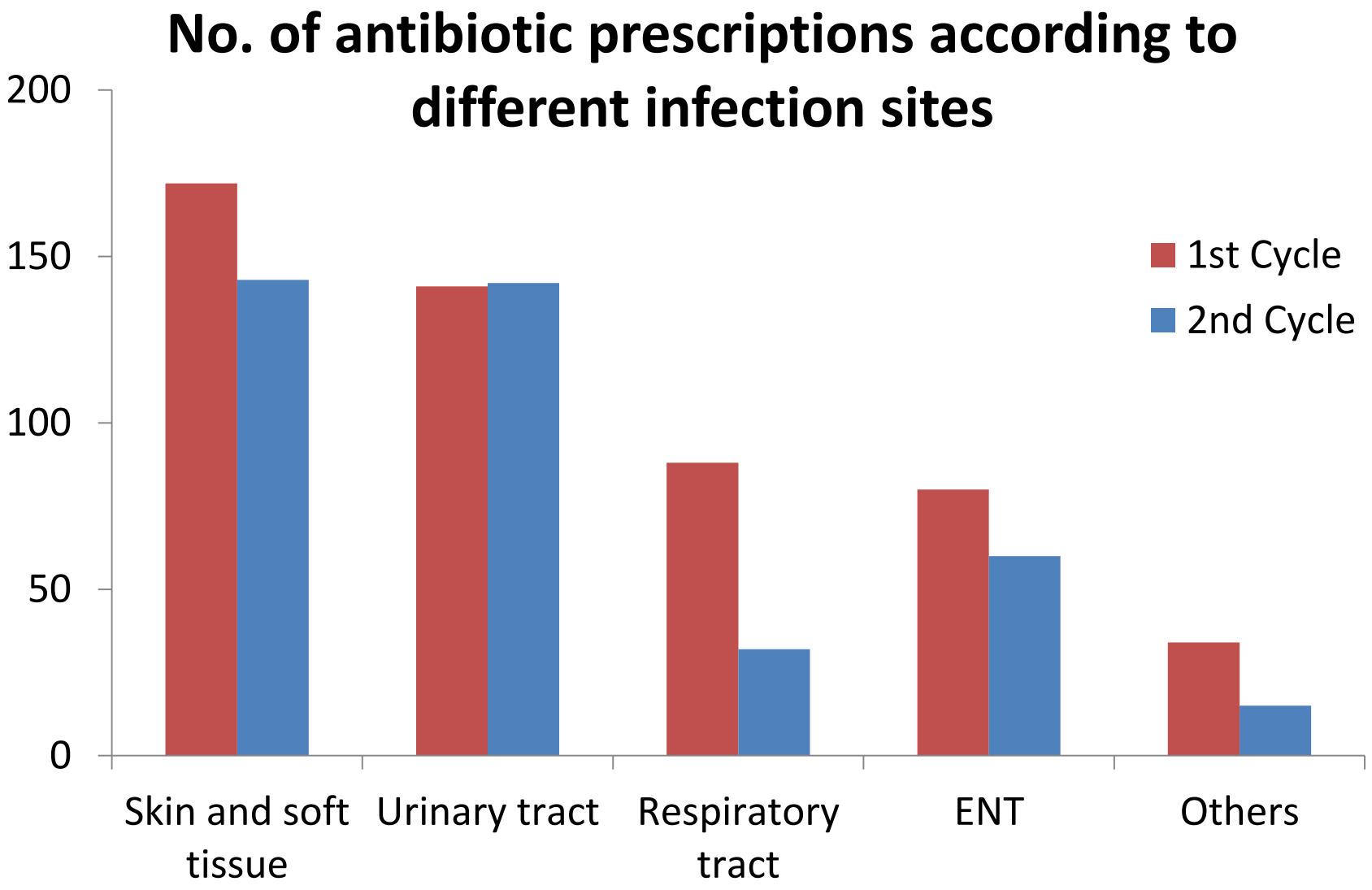
Results (4)

Diagnoses with inappropriate indications of antibiotic prescription in 1st Cycle (N=89)

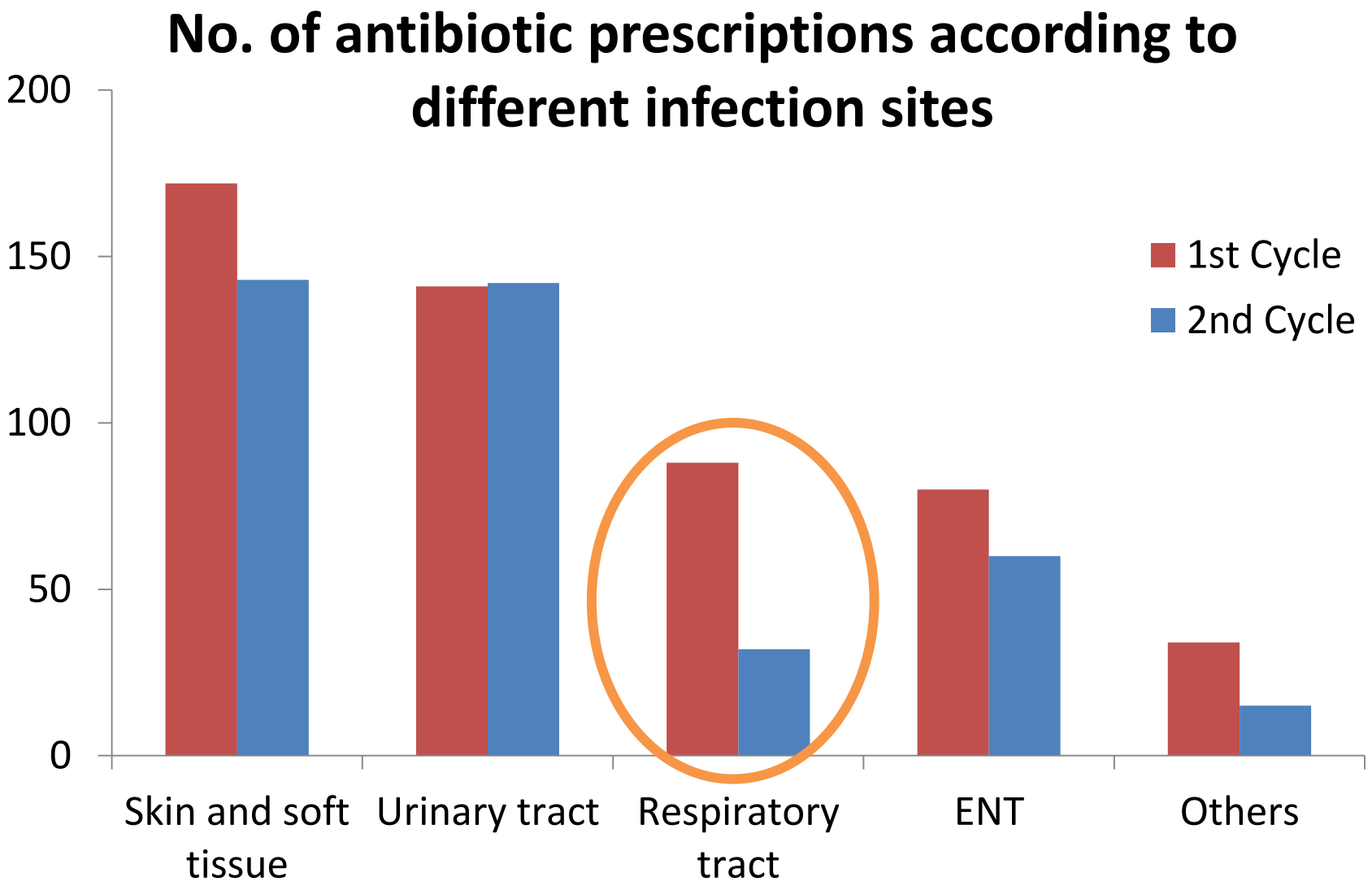


- Respiratory infections e.g. URI (21%), acute bronchitis (14%), asthmatic attack (7%)
- ENT infections e.g. AOM (17%), acute tonsillitis (6%), CSOM (5%)
- Urinary tract infections/ asymptomatic bacteriuria
- Skin infections
- Others

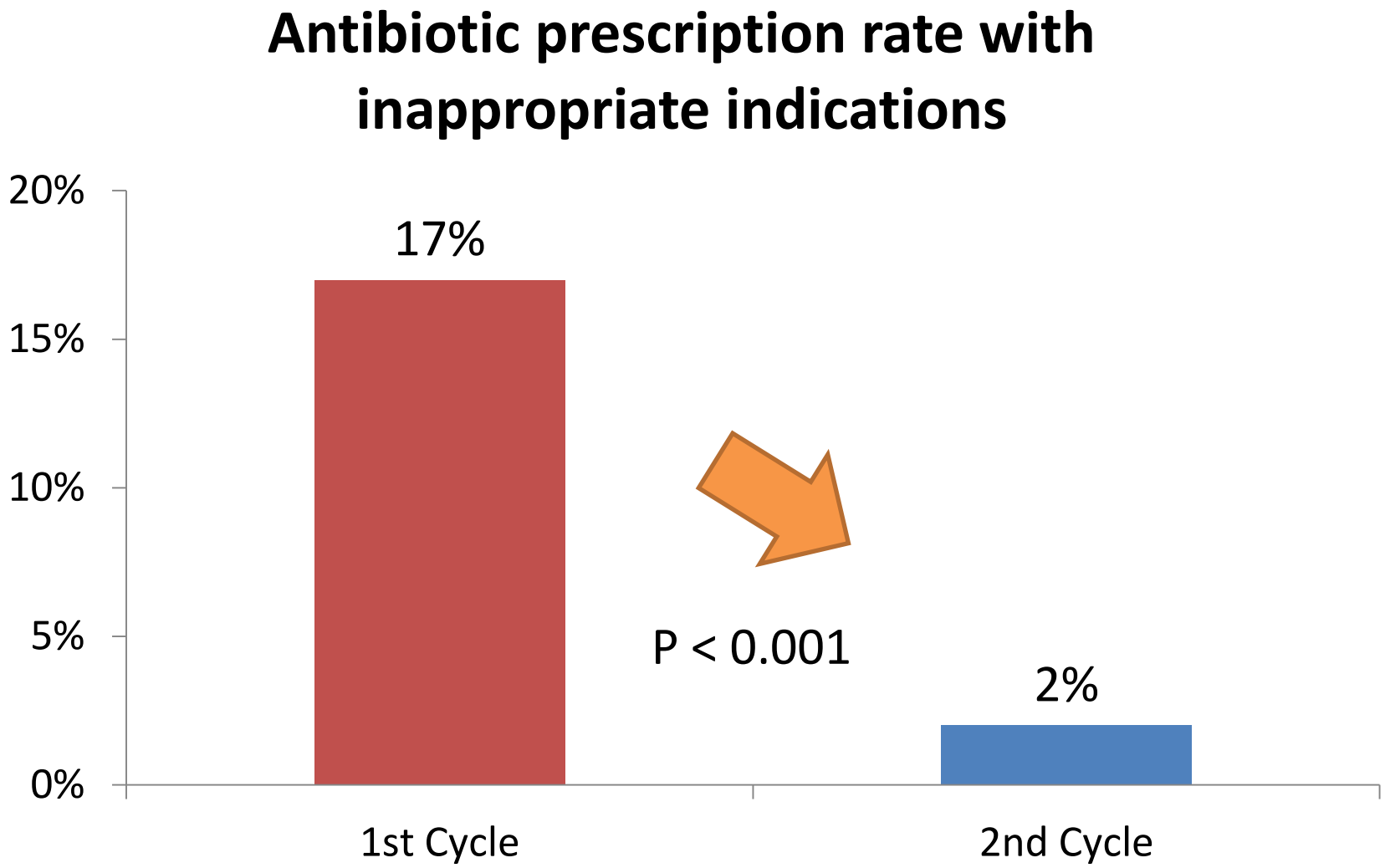
Results (5)


No. of antibiotic prescriptions according to different infection sites
200
150
100
50
0
1st Cycle
2nd Cycle
Skin and soft tissue
Urinary tract
Respiratory tract
ENT
Others

Results (5)


No. of antibiotic prescriptions according to different infection sites
200
150
100
50
0
1st Cycle
2nd Cycle
Skin and soft tissue
Urinary tract
Respiratory tract
ENT
Others

Results (6)


Antibiotic prescription rate with inappropriate indications
20%
15%
10%
5%
0%
17%
2%
P < 0.001
1st Cycle
2nd Cycle

Results (7)

- The prescription of antibiotics with inappropriate choice, dosage and duration also showed statistically significant improvement after the audit exercise
- Common examples of improvement:
  - Choice of antibiotic in diagnosis of community acquired pneumonia
  - Dosage of antibiotic in diagnosis of bacterial vaginosis
  - Duration of antibiotic in diagnosis of uncomplicated urinary tract infection

Conclusion

- Antibiotic resistance will continue to be a constant health threat globally in the coming years
- With appropriate training, updated guidelines and audit exercises, family physicians could help to reduce and prevent antibiotic resistance by prescribing antibiotic appropriately

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- Costelloe at el. Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: systematic review and meta-analysis. BMJ 2010; 340: c2096
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- Lam at el. Use of antibiotics by primary care doctors in Hong Kong. Asia Pac Fam Med. 2009; 8(1):5
- Recommendations for the oral antibiotics of common infections in KEC GOPCs (Adults)
- Recommendations for the oral antibiotics of common infections in KEC GOPCs (Children)

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Thank you