

# Supplementary

**Table 1.** List of keywords

<b>Crew AND</b>	<b>beliefs AND</b>	<b>Infectious agent AND</b>	<b>cruise AND</b>
OR	OR	OR	OR
Mariners	social/societal	influenza	expedition vessels
Sailors	cultural	Virus/ral	ships
Seafarers	intention	Epidemics	Ferries
Seamen	knowledge	pandemics	marine terminal
	attitude	Vaccine	point of entry
	behavioral	biological threat	dock/pier
	spread	Pathogen	Anchorage
	perception	public health hazard	Embarkation
	acceptance	disease outbreaks	Passageway
	exposure	public health threat	shore visit/leave
	transmission	Contagion	harbor
	dissemination	COVID/Sars	port
	facilitator/barrier	communicable	
	adherence	handwashing	
	compliance	Facemask	
	consent	Distancing	
		PPE/personal protective equipment	
		Hygiene	
		Guidelines	
		precautionary measures	
		prevention	
		Mitigation	
		Policies	

Note: different forms of search terms including plural were included.

**Table 2.** Search strategy for each database

**a.** Web of Science Core Collection

Search strategy	No of records
#1 (seafarer OR mariner OR sailor OR seamen OR (ship AND crew) ) All Fields	1278
#2 (seafarer OR mariner OR sailor OR seamen OR (ship AND crew) ) All Fields AND (attitude OR belief OR knowledge OR spread OR flu OR vaccine OR transfer OR covid-19 OR sars)	529
#3 (seafarer OR mariner OR sailor OR seamen OR (ship AND crew) ) All Fields AND (attitude OR belief OR knowledge OR spread OR compliance OR adherence OR facilitator OR barrier OR acceptance OR transfer All Fields AND flu OR vaccine OR covid-19 OR sars)	628
#4 (seafarer OR mariner OR sailor OR seamen OR (ship AND crew) ) All Fields AND (attitude OR belief OR knowledge OR transfer OR spread OR compliance OR adherence OR facilitator OR barrier OR acceptance All Fields AND flu OR vaccine OR covid-19 OR sars) All Fields AND handwashing OR distancing OR facemask All Fields AND ship OR vessel OR expedition OR cruise OR port OR dock OR pier	381
#5 (seafarer OR mariner OR sailor OR seamen OR (ship AND crew) ) All Fields AND ( attitude OR belief OR knowledge OR transfer OR spread OR compliance OR adherence OR facilitator OR barrier OR acceptance)) All Fields AND flu OR vaccine OR covid-19 OR sars) All Fields AND handwashing OR distancing OR facemask All Fields AND ship OR vessel OR expedition OR cruise OR port OR dock OR pier All Fields AND public health risk OR viral OR biological threat OR policy OR guidelines OR PPE OR precautionary OR hygiene OR prevention OR control OR mitigation	158

**b.** Scopus

Search strategy	No of records
#1 (TITLE-ABS-KEY (seafarer OR mariner OR sailor OR seamen OR (ship AND crew) ) AND TITLE-ABSKEY (attitude OR belief OR knowledge OR spread OR flu OR vaccine OR transfer OR covid-19 OR sars) ) AND PUBYEAR > 2009 AND PUBYEAR > 2009	1478
#2 (TITLE-ABS KEY (seafarer OR mariner OR sailor OR seamen OR (ship AND crew) ) AND TITLE-ABS-KEY (attitude OR belief OR knowledge OR perception OR social OR societal OR cultural OR intention) AND TITLE-ABS-KEY ( transmission OR spread OR dissemination OR infection) ) AND PUBYEAR > 2009 AND PUBYEAR > 2009	122
#3 (TITLE-ABS-KEY (seafarer OR mariner OR sailor OR seamen OR (ship AND crew)) AND TITLE-ABS-KEY (attitude OR belief OR knowledge OR flu OR vaccine OR transfer OR spread OR covid-19 OR sars) AND TITLE-ABS-KEY ((handwashing) OR distancing OR facemask OR vaccine ) ) AND PUBYEAR > 2009 AND PUBYEAR > 2009	13
#4 (TITLE-ABS-KEY (seafarer OR mariner OR sailor OR seamen OR (ship AND crew) ) ) AND TITLE-ABS-KEY (attitude OR belief OR knowledge OR spread OR transfer OR covid-19 OR sars OR communicable OR flu) AND TITLE-ABS-KEY ( (handwashing) OR distancing OR facemask OR vaccine OR public health risk OR viral OR biological threat) AND TITLE-ABS-KEY (cruise OR vessel AND expedition OR ferry OR travel OR port OR dock OR harbor OR pier OR marine OR embarkation) ) AND PUBYEAR > 2009 AND PUBYEAR > 2009	3

**c.** Google Scholar

Search strategy	No of records
(seafarer OR mariner OR sailor OR seamen OR (ship AND crew) ) AND (attitude OR belief OR knowledge OR transfer OR spread OR compliance OR adherence OR facilitator OR barrier OR acceptance)) AND flu OR vaccine OR COVID-19 OR sars) AND handwashing OR distancing OR facemask AND ship OR vessel OR expedition OR cruise OR port OR dock OR pier AND public health risk OR viral OR biological threat OR policy OR guidelines OR PPE OR precautionary OR hygiene OR prevention OR control OR mitigation	216

**Table 3.** Eligibility criteria

	<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
Language	English, Scandinavian, German, French	Studies published in languages other than those included in the inclusion criteria
Date of publication	2010–2022	
Publication status	Peer-reviewed journal articles and reviews, and grey literature	Systematic reviews, conference abstracts, and editorials
Type of data	Qualitative and quantitative	
Study design	Randomized Controlled Trials, cohort studies, observational, cross-section and al, and case-control studies	
Study population	Crews, all genders	
Determinants	Sociocultural factors (country of origin, employment, education) attitudes, behaviors, beliefs, perceptions	
study refers to	sociocultural factors	
study refers to	infectious diseases	

Table 4. Characteristics of the Included Studies

Author/Year	Study Title	Study Objective	Location	Study Design	Participant Characteristics	Sample Size	Data Collection Tool	Main outcome Measure
Obiageli et al. 2021	Knowledge, Attitude, and Perception of COVID-19 among Maritime Workers in the United Kingdom and Nigeria during the First Wave of the Pandemic	Examine the Knowledge, Attitudes, and Perceptions of maritime workers toward the COVID-19 pandemic	Nigeria and the United Kingdom	Cross-Sectional	Maritime Workers	100	Online Questionnaire	Knowledge, Attitudes, and Perceptions towards COVID-19
Battineni G. et al. 2021	Assessment of Awareness and Knowledge of Novel Coronavirus (COVID-19) Pandemic among Seafarers	Assess awareness and knowledge of seafarers towards the COVID-19 pandemic	Italy	Cross-Sectional	Seafarers	1458	Online Questionnaire	Awareness and Knowledge assessment of seafarers towards COVID-19
Faye et al. 2013	Study of determinants of unprotected sex in sailors of the Senegalese merchant navy	To analyze the determinants of unprotected sex among sailors in Senegal	Senegal	Cross-sectional	Merchant Navy Sailor	400	Face to face Questionnaire	Determinants of Unprotected Sex (Knowledge, Attitude, and Practices)
Grappasonni et al. 2011	Survey on HIV risk perception and sexual behaviors among seafarers	To evaluate awareness and knowledge of the risk of HIV infection among seafarers and risky behaviors for HIV transmission were also assessed	Italy	Cross-Sectional	Seafarers	197	Questionnaire sent by mail	Awareness and Knowledge of the risk of HIV infection and risky behavior
Guevara et al. 2010	Cross-sectional survey on the knowledge, attitude, and practice of male Filipino seafarers regarding sexual health	To determine the level of knowledge, as well as the attitudes and practices (KAP) of male Filipino seafarers regarding sexual health	Philippines	Cross-sectional	Seafarers/sea-based Overseas Workers	100	Questionnaire	Level of knowledge, attitudes, and practices (KAP) regarding sexual health
Jovićević et al. 2019	Awareness of HIV/AIDS and other sexually transmitted infections among Montenegrin seafarers	To assess the level of knowledge about HIV and other STIs among Montenegrin sailors	Montenegro	Cross-sectional	Seafarers	543	Questionnaire	Knowledge levels about HIV and other STIs

Author/Year	Study Title	Study Objective	Location	Study Design	Participant Characteristics	Sample Size	Data Collection Tool	Main outcome Measure
Laraqui et al. 2017	The assessment of seafarers' knowledge, attitudes, and practices related to STI/HIV/AIDS in northern Morocco	To assess the knowledge, attitudes, and practices of seafarers about sexually transmitted infections (STI) and human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS)	Morocco	Cross-sectional	Seafarers	1447	Face to face Questionnaire	Knowledge, Attitudes and Practices about STIs and HIV/AIDS
Robate et al. 2010	Sexual behavior of Kiribati seafarers: second generation surveillance in 2005 and 2008	To conduct HIV and STI prevalence and behavior surveys among seafarers	Kiribati	Cross-sectional	Seafarers	462	Questionnaire	Sexual behavior of Kiribati seafarers
Saniel and De los Reyes 2010	Prevalence of risky behaviors and determinants of multiple-sex partnerships among male Filipino seafarers	To describe the HIV/AIDS knowledge, attitudes, and related practices among male Filipino seafarers assigned to non-passenger vessels.	Philippines	Cross-sectional	Seafarers	501	Questionnaire	HIV/AIDS knowledge, attitudes, and related practices

**Table 5.** Critical Appraisal tools for use in JBI Systematic Reviews

**Author:** Chowdhury et al.      **Year:** 2016

**HIV/AIDS, health, and wellbeing study among International Transport Workers' Federation (ITF) seafarer affiliates**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?		X		
Were the study subjects and the setting described in detail?	X			
Was the exposure measured in a valid and reliable way?			X	
Were objective, standard criteria used for measurement of the condition?			X	
Were confounding factors identified?		X		
Were strategies to deal with confounding factors stated?		X		
Were the outcomes measured in a valid and reliable way?			X	
Was appropriate statistical analysis used?			X	

**Overall appraisal**    Include:      Exclude: X      Seek further info:

**Comments (Including reason for exclusion):** The score is below average.

**Author:** Obiageli et al.      **Year:** 2021      **Record Number:**

**Knowledge, Attitude, and Perception of COVID-19 among Maritime Workers in the United Kingdom and Nigeria during the First Wave of the Pandemic**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?	X			
Were the study subjects and the setting described in detail?	X			
Was the exposure measured in a valid and reliable way?	X			
Were objective, standard criteria used for measurement of the condition?	X			
Were confounding factors identified?		X		
Were strategies to deal with confounding factors stated?		X		
Were the outcomes measured in a valid and reliable way?	X			
Was appropriate statistical analysis used?	X			

**Overall appraisal**    Include: X      Exclude:      Seek further info:

**Comments (Including reason for exclusion)**

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**Author:** Battineni et al.      **Year:** 2021      **Record Number:**

**Assessment of Awareness and Knowledge of Novel Coronavirus (COVID-19) Pandemic among Seafarers**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?	X			
Were the study subjects and the setting described in detail?	X			
Was the exposure measured in a valid and reliable way?	X			
Were objective, standard criteria used for measurement of the condition?	X			
Were confounding factors identified?		X		
Were strategies to deal with confounding factors stated?		X		

	Yes	No	Unclear	Not Applicable
Were the outcomes measured in a valid and reliable way?	X			
Was appropriate statistical analysis used?	X			

**Overall appraisal** Include: X Exclude: Seek further info:

**Comments (Including reason for exclusion)**

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**Author:** Faye et al. **Year:** 2014

**Record Number:**

**Étude des déterminants des rapports sexuels non protégés chez les marins de la marine marchande sénégalaise.**

**Study of determinants of unprotected sex in sailors of the Senegalese merchant navy**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?	X			
Were the study subjects and the setting described in detail?	X			
Was the exposure measured in a valid and reliable way?	X			
Were objective, standard criteria used for measurement of the condition?	X			
Were confounding factors identified?		X		
Were strategies to deal with confounding factors stated?		X		
Were the outcomes measured in a valid and reliable way?	X			
Was appropriate statistical analysis used?	X			

**Overall appraisal** Include: X Exclude: Seek further info:

**Comments (Including reason for exclusion)**

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**Author:** Guevara et al.

**Year:** 2010

**Record Number:**

**Cross-sectional survey on the knowledge, attitude, and practice of male Filipino seafarers on sexual health**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?	X			
Were the study subjects and the setting described in detail?	X			
Was the exposure measured in a valid and reliable way?	X			
Were objective, standard criteria used for measurement of the condition?	X			
Were confounding factors identified?		X		
Were strategies to deal with confounding factors stated?		X		
Were the outcomes measured in a valid and reliable way?	X			
Was appropriate statistical analysis used?	X			

**Overall appraisal** Include: X Exclude: Seek further info:

**Comments (Including reason for exclusion)**

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**Author:** Grappasonni et al.    **Year:** 2011    **Record Number:**  
**Survey on HIV risk perception and sexual behaviors among seafarers**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?	X			
Were the study subjects and the setting described in detail?	X			
Was the exposure measured in a valid and reliable way?	X			
Were objective, standard criteria used for measurement of the condition?	X			
Were confounding factors identified?		X		
Were strategies to deal with confounding factors stated?		X		
Were the outcomes measured in a valid and reliable way?	X			
Was appropriate statistical analysis used?	X			

**Overall appraisal**    Include: X    Exclude:    Seek further info:

**Comments (Including reason for exclusion)**

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**Author:** Jovicevic et al.    **Year:** 2019    **Record Number:**

**Awareness of HIV/AIDS and other sexually transmitted infections among the Montenegrin seafarers**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?	X			
Were the study subjects and the setting described in detail?	X			
Was the exposure measured in a valid and reliable way?	X			
Were objective, standard criteria used for measurement of the condition?	X			
Were confounding factors identified?		X		
Were strategies to deal with confounding factors stated?		X		
Were the outcomes measured in a valid and reliable way?	X			
Was appropriate statistical analysis used?	X			

**Overall appraisal**    Include: X    Exclude:    Seek further info:

**Comments (Including reason for exclusion)**

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**Author:** Laraqui et al.    **Year:** 2017    **Record Number:**

**The assessment of seafarers' knowledge, attitudes, and practices related to STI/HIV/AIDS in northern Morocco**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?	X			
Were the study subjects and the setting described in detail?		X		
Was the exposure measured in a valid and reliable way?	X			
Were objective, standard criteria used for measurement of the condition?	X			
Were confounding factors identified?		X		



Were strategies to deal with confounding factors stated?	X
Were the outcomes measured in a valid and reliable way?	X
Was appropriate statistical analysis used?	X

**Overall appraisal** Include: X Exclude: Seek further info:

**Comments (Including reason for exclusion)**

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**Author:** Robate et al. **Year:** 2010 **Record Number:**

**Sexual behavior of Kiribati seafarers: second generation surveillance in 2005 and 2008**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?	X			
Were the study subjects and the setting described in detail?	X			
Was the exposure measured in a valid and reliable way?	X			
Were objective, standard criteria used for measurement of the condition?	X			
Were confounding factors identified?		X		
Were strategies to deal with confounding factors stated?		X		
Were the outcomes measured in a valid and reliable way?	X			
Was appropriate statistical analysis used?	X			

**Overall appraisal** Include: X Exclude: Seek further info:

**Comments (Including reason for exclusion)**

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**Author:** Daniel and De los Reyes **Year:** 2010 **Record Number:**

**Prevalence of risky behaviors and determinants of multiple sex partnerships among male Filipino seafarers**

	Yes	No	Unclear	Not Applicable
Were the criteria for inclusion in the sample clearly defined?	X			
Were the study subjects and the setting described in detail?	X			
Was the exposure measured in a valid and reliable way?	X			
Were objective, standard criteria used for measurement of the condition?	X			
Were confounding factors identified?			X	
Were strategies to deal with confounding factors stated?	X			
Were the outcomes measured in a valid and reliable way?	X			
Was appropriate statistical analysis used?	X			

**Overall appraisal** Include: X Exclude: Seek further info:

**Comments (Including reason for exclusion)**

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**Table 6.** Description of KAP of the included studies

Author (Year)	Knowledge	Attitude	Practices
Obiageli UN et al. (2021)	<ul style="list-style-type: none"> <li>• Considerable knowledge about COVID-19</li> <li>– 95% (Nigeria) and 92.5% (UK) had heard about the novel coronavirus</li> <li>• Majority of participants knew COVID-19 symptoms and mode of transmission</li> <li>• Satisfactory knowledge of ways to reduce transmission</li> </ul>	<ul style="list-style-type: none"> <li>• Negative attitude towards people of Asian origin or with Asian sounding names</li> <li>• Negative attitude towards attending educational lectures and discussions on coronavirus</li> </ul>	
Battineni G et al. (2021)	<ul style="list-style-type: none"> <li>• Good knowledge of COVID-19</li> <li>• 97.4% knew about COVID-19</li> <li>• 97.3% were aware that it can be transmitted through humans</li> <li>• 98.4% of seafarers were knowledgeable about the mode of transmission of the novel coronavirus</li> <li>• 99.4% were knowledgeable of the COVID-19 symptoms</li> <li>• Majority of respondents were knowledgeable about preventive measures to control the spread of COVID-19</li> </ul>	<ul style="list-style-type: none"> <li>• Positive approach towards COVID-19</li> <li>– Anticipated covering their face when they sneezed or coughed</li> <li>– Choose disinfectants for cleaning their hands in the absence of hand soap</li> </ul>	<ul style="list-style-type: none"> <li>• Good practices among the seafarers</li> <li>• 97% avoided touching their face.</li> <li>• 84% adhered to social distancing onboard</li> <li>• 77.3% wore masks while onboard</li> </ul>
Faye A et al. (2013)	<ul style="list-style-type: none"> <li>• All sailors had heard of HIV/AIDs (100%)</li> <li>• Good knowledge of HIV transmission</li> <li>• Fair levels of knowledge on preventive measures</li> </ul>	<ul style="list-style-type: none"> <li>• Negative attitude towards condom use</li> <li>– 33% claimed condoms reduced pleasure</li> </ul>	<ul style="list-style-type: none"> <li>• 23.7% unprotected sex</li> </ul>
Grappasonni I et al. (2011)	<ul style="list-style-type: none"> <li>• Good knowledge about HIV/AIDs</li> <li>• 88.8% of seafarers had information about HIV</li> <li>• Knowledgeable about the mode of HIV/AIDs transmission</li> <li>• 85.3% unprotected hetero and homosexual relations</li> <li>• 75.1% transfusion of infected blood</li> <li>• 56.8% mother-to-child transmission</li> </ul>		<ul style="list-style-type: none"> <li>• Unsatisfactory practices</li> <li>• 56.4% of seafarers and 46.7% of captains, and deck and engine officers claimed regular use of condoms with occasional partners</li> <li>• 13.7% of seafarers always used a condom with wives and girlfriends</li> </ul>
Guevara N et al. (2010)	<ul style="list-style-type: none"> <li>• Good knowledge about sexual health</li> <li>• 96.2%, identified HIV/AIDs as STI gonorrhea (75.5%), and syphilis (73.6%), and only 69% identified herpes as an STI</li> <li>• Fair knowledge of transmission and symptoms</li> <li>– 62.8% knowledgeable about the mode of transmission</li> <li>– 76.6% were knowledgeable about the symptoms</li> <li>– Poor knowledge levels of prevention</li> <li>– Only 57.37% knew about preventive measures</li> </ul>	<ul style="list-style-type: none"> <li>• Good attitudes regarding condom use and risky behavior, informing partners of STI status, and general opinion on persons with STIs</li> <li>– 93% disagreed with sexual intercourse with an infected person</li> </ul>	<ul style="list-style-type: none"> <li>• Good levels of practice regarding sexual health</li> <li>• Positive practices including the use of condoms, voluntary medical evaluation for STIs, and avoidance of high-risk partners</li> <li>• Negative practices including going to bars closely linked with prostitution</li> <li>• Having sexual intercourse with sex workers overseas</li> <li>• 59% engaged in sexual intercourse outside the current stable relationship</li> </ul>
Jovičević et al. (2019)	<ul style="list-style-type: none"> <li>• Unsatisfactory levels of knowledge of HIV/AIDs and other STIs (47.9%)</li> <li>• Unsatisfactory levels of knowledge on transmission</li> <li>• Insufficient knowledge and information on prevention</li> <li>• Limited knowledge of preventive measures</li> </ul>		<ul style="list-style-type: none"> <li>• Only 22.3% of them were tested on HIV, 8.1% on hepatitis B and only 6.8% on hepatitis C</li> </ul>

Author (Year)	Knowledge	Attitude	Practices
Laraqui et al. (2017)	<ul style="list-style-type: none"> <li>• Good knowledge about HIV</li> <li>• Good levels of knowledge about HIV/AIDS transmission and prevention</li> <li>• modes of transmission cited included unprotected sexual intercourse (98%), blood-stained object usage (91%), mother-to-child transmission (78.3%), and breastfeeding (54.2%)</li> <li>• Unsatisfactory knowledge of symptoms</li> </ul>	<ul style="list-style-type: none"> <li>• High levels of stigmatization and discrimination towards people living with the virus</li> <li>– 45% refused to share meals with PLHIV</li> <li>• 38% did not like using condoms</li> <li>– 32.5% thought condoms were unnecessary because they were married</li> <li>– 53.1% believed that an HIV-positive sailor asymptomatic should not be allowed to work</li> </ul>	<ul style="list-style-type: none"> <li>• Significant levels of high-risk behavior</li> <li>• 32% had at least 2 sexual partners</li> <li>• 26.3% had sex with sex workers of which 60% did not use condoms</li> <li>• 10.2% had done the test</li> <li>• 42.8% had never used a condom</li> <li>• 29.8% rarely used condoms</li> <li>• 30.3% usually had sex under the influence of alcohol (44% did not use any protection)</li> <li>• 48.1% avoided sex during the infection period</li> </ul>
Robate et al. (2010)	<ul style="list-style-type: none"> <li>• Good knowledge of HIV transmission and prevention</li> </ul>		<ul style="list-style-type: none"> <li>• High-risk behaviors were reported</li> <li>• 55.2% reported having more than one sexual partner</li> <li>• 35% reported having engaged in transactional sex</li> <li>• 78% had multiple transactional sexual partners</li> </ul>
Saniel and De los Reyes (2010)	<ul style="list-style-type: none"> <li>• Good knowledge of STIs</li> <li>• Inadequate knowledge about HIV transmission and prevention</li> <li>• Less than 7% had relatively good knowledge about HIV transmission and prevention</li> </ul>	<ul style="list-style-type: none"> <li>• Negative attitude towards condom use</li> <li>– 12% thought condoms were ineffective</li> <li>• Negative attitude towards people living with HIV</li> <li>– Only 4% had positive attitude</li> </ul>	<ul style="list-style-type: none"> <li>• Good practices</li> <li>• 83.6 reported at least one regular sexual partner</li> <li>• 70% reported having an HIV test</li> <li>• 73% attended PDOS trainings which contained a 45-minute module on HIV</li> <li>• 15% had had commercial sex (20% without protection)</li> </ul>