

Sexually Transmitted Infections and the Use of Condoms in Biology Textbooks.

A Comparative Analysis Across Sixteen Countries.

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ABSTRACT: Our study focused on two topics, Sexually Transmitted Infections (STIs) and their control using condoms. For this, we analysed and compared 42 school textbooks from 16 countries on the general topic “Human Reproduction and Sex Education” using a specific grid designed by the BIOHEAD-Citizen project. Acquired Immune Deficiency Syndrome (AIDS) was a common topic in all the textbooks that were analyzed, although it appeared in quite different chapters, such as, Human Procreation (the control of reproduction, the hygiene of reproduction, or in chapters devoted to STIs and AIDS), Immunology (with AIDS as an example of immune deficiency), and Personal Protection. Some textbooks provided information about other STIs in addition to AIDS. There appeared important differences among countries concerning both the number of images in the textbooks and the number of STIs that were discussed in the textbooks. There were also differences among various textbooks addressing the same educational level that came from different publishers in terms of the way that STIs were presented. More than half of the analyzed textbooks did not link the presentation of STIs with their prevention via the use of condoms, and only a few textbooks illustrated an unrolled male condom on the penis. Our results also indicated that (i) for most of the analyzed biology textbooks there was a preference for the biomedical model of health education that provided sufficient scientific

knowledge, (ii) only in Finland, there was an attempt for promoting competencies relating to a healthy sexual behaviour, and (iii) the textbooks from Morocco and Tunisia illustrated how traditional values could be promoted in parallel with biomedical knowledge by using injunctive moral content. Interactions between scientific knowledge (K), values (V), and social practices (P) had been found and seemed to determine what was present (and how) in school textbooks.

KEY WORDS: Multiculturalism, school textbooks, sex education, sexually transmitted infection.

Introduction: Theoretical Background and Reflection

The main goal of the European project BIOHEAD-Citizen “Biology, Health and Environmental Education for better Citizenship” (FP6) was to clarify and improve understanding of how different aspects of citizenship, including emotional and social dimensions, are promoted or can be promoted through Biology, Health, and Environmental Education. In this context, we undertook a comparative analysis of the contents of school textbooks from 16 different countries. Twelve of these countries are in Europe, with varying geographical and cultural characteristics (catholic, protestant, orthodox), and four are not in Europe (Lebanon, Tunisia, Morocco, and Senegal). Here, we present our first results related to the health dimension of human reproduction and sexuality.

In schools, health education usually intends to inform students about the dangers of certain lifestyles or behaviours (e.g., smoking, taking drugs, bad eating habits, etc.), but it should also promote pupils’ ability to develop healthy attitudes and behaviours (Fayard, 2005). This health promotion view (Downie & Tannahill, 1996), which includes the development of responsible sexual behaviour in a pupil, was defined by the WHO (1986) in the Ottawa Charter for Health Promotion as:

the process of enabling people to increase control over, and to improve their health [...] health promotion is not just the responsibility of the health sector, but goes beyond healthy life-styles to well-being (p. 1).

More recently, and within the health-promotion framework, health education approaches have aimed increasingly to develop pupils’ reflection and awareness in order to empower them, and improve their autonomy and their capacity for making their own well-informed choices, whatever they may be (St Leger, 2001; Carvalho, 2006a). This strategy implies recognizing students’ personal values, attitudes and beliefs, as well as improving their awareness about what motivates their personal choices and about the consequences of such choices, regarding not only the individual well-being, but also the implications for a better citizenship (Carvalho, 2006b).

Constructing one’s sexuality concerns the construction of values, such as, tolerance and critical judgment, freedom, respect, and social responsibility (Mamecier & Michard, 2004). Sex education should also include several dimensions, such as, biological, psychological, affective, and socio-cultural (Picod & Guigné, 2005), dealing with such things as body growth, expressions of sexuality, interpersonal relations, and sexual and reproductive health (Vaz, Vilar, & Cardoso, 1996).

Although the methods for textbook research are ‘*fundamentally underdeveloped and in need of further research*’ (Nicholls, 2003, p. 1), some specific studies can be found in the literature, which used general techniques that are independent of the

contents (Pingel, 1999; Mikk, 2000). Our own approach is specific to the didactics of science (or science education), and focuses on specific scientific contents.

Textbooks, as well as syllabuses, represent a specific level within the didactic transposition model (Clément, 2006; Bernard, Clément, & Carvalho, 2007). It is the result of several strategies, such as: (a) strategies leading to the drafting of official syllabuses and programmes involving the influence of different stakeholders (i.e., the Ministry of Education and other main policy makers of the educational system, families, associations, unions and other political groups, as well as the personal views of each syllabus committee member; (b) the strategies of the textbook publishers (marketing); (c) the authors' strategies for textbooks (assumed to represent the needs of teachers and students); (d) the strategies of the diffusers of images (images databases), etc. (Bruillard, 2005; Bernard *et al.*, 2007).

Our research questions were formulated as follows: Do Biology textbooks contribute to the development of responsible attitudes towards sexuality? Do textbooks help children or young people to develop the capacity to make informed choices, to adopt responsible behaviours for themselves as well as the respect towards the others?

The general theoretical background of our research was the KVP Model (Clément, 2004, 2006). Thus, we analysed the conceptions expressed in the textbooks as interactions among K (scientific knowledge), V (systems of values), and P (social practices).

In textbooks, the presentation of Sexually Transmitted Infections (STIs), including AIDS and the control of STIs by the use of condoms, imply strong interactions between K, V, and P. Condoms are the only contraceptive method proven to reduce the risk of the transmission of STIs (WHO, 2004), and thus we decided to focus on the use of condoms as a means of disease prevention and not just as a mechanical (barrier) contraceptive method. We wanted to study sex and health education with regard to its importance in everyday life, the way biological aspects overlap with emotional and moral issues, and the interactions between content and socio-cultural contexts. Thus, our key questions were about whether specific contents in textbooks and their pedagogical styles were the same in countries where sexuality is traditionally more free (Northern Europe), and/or whether they were strongly influenced by the dominant religion (as in Muslim countries of Northern Africa or Orthodox countries like Cyprus). We also attempted to investigate whether there were any differences between East and West Europe, perhaps due to different social values.

Methodology

A Comparative Study Covering Sixteen Countries

The didactics of a discipline usually focuses on what needs to be taught and learned. Thus, a didactic analysis of textbooks treats their contents and pedagogical approach, and also seeks to identify their explicit and implicit messages. We adopted a contrastive method that is particularly useful as a heuristic tool for studying textbooks. It includes a two-stage analysis. Firstly, an analysis of each textbook, and then comparison among them that takes into account the socio-cultural context of each one.

This work compared textbooks from 16 different countries that have a lot of differences among them. There were four non-European countries, including three Muslim countries (Tunisia, Morocco, and Senegal) and one multi-religious one (Lebanon). The twelve other countries were from the North, South, West, and East of Europe representing different cultures and religions. While generally secular states, these countries are predominantly, Catholic, Protestant, or Orthodox.

Corpus

The topic of Human Reproduction can be approached in different chapters of textbooks, starting with reproductive anatomy and including the hormonal control of the sexual cycles. It is within this range of chapters that textbooks usually treat the control of reproduction and the STIs. We analyzed both topics, STIs and their prevention, as they are rather pertinent to the development of a pupil's responsible sexual behaviour.

The corpus was composed of 42 textbooks from 16 countries, as indicated in Table 1. In the case of 5 countries (Germany, Lithuania, Poland, Romania, and Senegal), only one textbook was analyzed. For the 11 other countries, different textbooks from different publishers were analyzed.

Table 1
List of the 42 Analysed Textbooks, by Country and Geographical Area

Geographical Area	Country	Number of analysed textbooks	Age	Publisher
Europe	Cyprus	2	13–14	Ministry of Education & Culture, Middle Education. Administration, Curriculum Development Service 2001
			15–16	Ministry of Education, Direction of Middle Education & Service of Curriculum Development 2005
	Estonia	2	12–13	Avita 1998
			14–15	AS Bit 2003
	Finland	2	13–15	Tanja Lehtonen – WSOY Oppimateriaalit Oy 2006; Markku Kujala & Tanja Lehtonen – Werner Söderström Osakeyhtiö 2005
	France	4	13–14	Nathan 1998
			14–15	Nathan 2003; Hatier 2004; Bordas 2001
	Germany	1	14–15	Ulrike Fehrmann 2005 (1993)
	Hungary	3	12–13	Dr. Molnár Katalin 2004; Nagymihály Mátyás 2004
			15–16	Dr. Tóth Géza 2003
	Italy	6	11–13	Garzanti Scuola 2004; Edizione Il Capitello 2001; Fabbri Editori 2004
			14–18	Zanichelli 2006; Edizioni Scolastiche – Bruno Mondadori 1998; Loescher 2001
	Lithuania	1	17–18	Alma littera 1999
	Malta	2	13–16	D.G. Mackean 1988; M.B.V. Roberts 1986
	Poland	1	16–18	Operon 2004
			Portugal	10–11
13–14	Areal Editores 2004			
16–17	Porto Editora 2005			
Romania	1	13–14	Corint 2000	
North Africa and the Middle East	Lebanon	8	12–13	Habib 1999; ?Sciences- Librairie Khoury 2002; Le Pointier 1999
			15–16	Secondary Publishing Company 2000; Le Pointier 1999
			16–17	Center for Educational Research and Development 2002; Le Pointier 2000
			13–14	Dar Attakafa 2004
Morocco	3	14–15	Librairie Essalam Aljadida – Addar Alaalamia Likitab 2005	
		17–18	Ifriquia Charq 1996	
		14–15	Centre National Pédagogique 2005	
Tunisia	2	18–19	Centre National Pédagogique 2005	
		14–15	Nathan 1996	
Sub-Saharan Africa	Senegal	1	14–15	Nathan 1996
Total	16	42		

Grid for Analysis

An essential point of our methodology was to construct a grid to be used for the analysis of textbook contents in all countries participating in the BIOHEAD-Citizen project. The grid was constructed during the year 2005–2006 and tested preliminarily with few textbooks in most of the countries. The original grid was then improved and the modified grid was applied in all countries participating in the project. An entire grid was filled in for each textbook. The grid was 20-pages long and was divided into two parts. The first part was a general grid composed of nine sub-sections, such as, general introduction of the textbook structure, space dedicated to the topic in the textbook, ratio of text to pictorial information, types and functions of images, educational style, gender issues, stereotypes in images, moral stance, etc. The second part was a specific grid concerning Human Reproduction and Sex Education, made up of a list of indicators classified in different categories (male and female anatomy, STIs, sexual practices, etc.).

In this paper, we focused on STIs and their prevention (use of condoms), and we have analyzed only two subsections of this entire grid. A subsection of the first part of the grid was related to the educational style through which the two issues (STIs and the use of condoms) are addressed. It has been assumed that an injunctive discourse with moralizing content could inhibit children or lead them to reject the messages for prevention (Picod & Guigné, 2005). For this reason, we wanted to investigate how the authors of textbooks present these two issues, particularly whether there is only injunctive talk concerning the prevention of STIs, or whether contraceptive methods are presented accompanied by their advantages and disadvantages in terms of safety. Finally, we examined whether there exists any correlation between the educational style and the socio-cultural differences of the countries involved. Necessary information is presented in Table 2.

Table 2
Grid for the Identification of the Educational Style of the Textual Content about STIs and the Use of Condoms in the Chapters of Textbooks

Educational style	Informative and Imperative/Injunctive	Informative and Persuasive/Indicative	Informative and Participative	Only Informative/Descriptive
Problematic	Absent or present, but solutions are imposed with no argumentation	Present, but the argumentation tends only to a specific solution	Present, or to be discovered (by the students). Open to debate.	Absent
Proposal for action	Action imposed	Strong suggestion for the proposed actions which are also the only ones justified	Actions to be constructed, or to be chosen by the students	None
Sentence Style and Structure	'You must do this'; 'Do that; 'Because it is as it is'; 'Because this is the way'; 'Because science shows it'; 'Because religion says that' e.g.: 'Condom is a very thin rubber case used by a man, it must be put on before sexual intercourse and must be used only once.'	'You can conclude that'; 'It should be concluded that'; 'You should do this'; Do that'; e.g.: 'Used more and more it has the advantage of having a role in both contraception and prevention of sexually transmitted diseases such as AIDS.'	Presenting several points of view; Several solutions proposed; Asking for students' ideas, suggestions. e.g.: Several different contraceptive practices are cited with their advantages and their inconveniences.	'The data are'; 'The facts are'; 'The situation is'; 'The most important thing to know is' e.g.: 'Many couples wish to choose the moment for having a baby; Birth control is possible by methods of contraception.'

The other subsection of the second part of the grid was related to specific indicators concerning male and female condoms, and STIs. The presence or absence

of either indicator in both text and images of textbooks were recorded in the grid. We also considered what examples of STIs were presented in the textbooks, what types of methods of contraception were shown as offering protection against STIs (e.g., male and female condoms), and whether they were considered both as forms of birth control and means to prevent the transmission of STIs. Table 3 summarizes the collected information.

Table 3
Grid for the Presentation of Male and Female Condoms and STIs,
and Their Occurrences in the Chapters of Textbooks

Conceptions	Indicators	Images N ^o occurrences	Text Yes/No
Male Condom	<i>Male Condom image type</i>	<u>Photo Schema/Drawing</u>	
	Rolled condom		
	Unrolled condom		
	Penis in erection with condom		
	Penis with condom penetrating vagina		
	Condom on a penis-shaped object Others (specify)		
Female Condom	<i>Female Condom image type</i>	<u>Photo Schema/Drawing</u>	
	Rolled condom		
	Unrolled condom		
	Condom inside the vagina Others (specify)		
Sexually Transmitted Diseases /Infections (STDs / STIs)	Sexually Transmitted Diseases (STDs)		
	Sexually Transmitted Infections (STIs)		
	AIDS		
	HIV		
	<i>Other STDs</i>		
	Chlamydia		
	Genital Herpes (HSV)		
	Genital Warts (HPV)		
	Syphilis		
	Gonorrhoea		
	Chancroid		
	Viral Hepatitis		
	Vaginitis		
	Others (specify which STI)		
Risk			
Risk behaviours			
Sexual behaviours			
Sexual attitudes			
Prevention of STIs			
Others (specify)			

Note: In its complete version, this part of the grid included not only male and female condoms, but also others methods of contraception.

Results and Discussion

Sexually Transmitted Infections in Textbooks

Differences between Countries

Depending on the country, STIs were treated either in the part of the textbook devoted to Human Procreation (in the chapters about the control of the repro-

duction, the hygiene of reproduction, or directly in chapters devoted to STIs and AIDS), or the one dealing with Immunology (with AIDS in particular) or the chapters concerning protection of one's own body. The designation STIs (Sexually Transmitted Infections) that is used by the WHO (2003) was present in only 11 of the textbooks from eight countries (Italy, Cyprus, Estonia, Lebanon, Hungary, Lithuania, Morocco, and Finland). The older designation STDs (Sexually Transmitted Diseases) was used in 31 other textbooks.

Out of the 42 textbooks, only 20 included a subsection of a chapter dedicated to STIs or AIDS infection, and in only four (one from Senegal and from Estonia and two from Lebanon), there was a chapter specifically dedicated to STIs. We initially expected to find some information about STIs in chapters dealing with health education or perhaps with sex education. In fact, we identified one Moroccan textbook including STIs in the Health Education chapter. Two textbooks, one from Estonia and another from Finland, which were totally devoted to Health Education and were not restricted to Biology, also referred to the STIs.

As the subject of STIs can be taught at different school levels, we defined two age ranges of students from 11 to 15 and from 15 to 19 years old, as indicated in Table 4. The most commonly occurring STIs on a global scale were more often listed in the textbooks for 11 to 15 years old students, except in Lithuania and Poland textbooks, where they were found in textbooks for older students.

Table 4
Different STIs Found in the Textual Contents of the Analysed Textbooks (Including AIDS)

Country	STI AIDS	Syphilis	Gonorrhoea	Genital Herpes	Viral Hepatitis	Vaginitis	Chlamydia	Genital Warts	Chancroid
Senegal (1)	•	•	•	•	•	•	•	•	•
Lithuania (1)	◦	◦	◦	◦	◦	◦	◦	◦	
Finland (2)	••	•	••	••			••	••	
Malta (2)	••	••	••	••	••	•			
Romania (1)	•	•	•			•		•	
Cyprus (2)	•◦	•◦	•◦	•◦	•◦				
Hungary (3)	••◦	••◦	••◦	•	◦	••◦		◦	
Lebanon (8)	•••◦◦◦	•••◦◦	••◦◦	••◦◦	•	◦◦	••◦◦	•◦	
Italy (6)	•••◦◦◦	•••◦◦◦	•••◦◦◦	◦	◦	•	◦		
Germany (1)	•	•	•						
Estonia (2)	•	•	•	•			•	•	
Morocco (3)	••◦	•◦	•◦		•◦				
France (4)	•••	•	•	•	•	•	•	•	•
Tunisia (2)	•◦	•	•						
Portugal (3)	••			•	••				
Poland (1)	◦								
∑ (42)	36 24•/12◦	28 19•/9◦	28 19•/9◦	17 12•/5◦	14 9•/5◦	11 8•/3◦	11 7•/4◦	10 7•/3◦	2 2•

() Number of analyzed textbooks

• Textbooks for 11 to 15 year-old students

◦ Textbooks for 15 to 19 year-old students

AIDS was the only STI to be cited in all the textbooks and was explained along with HIV (Human Immunodeficiency Virus). Syphilis and Gonorrhoea were also well represented in the textbooks from all the countries, except Portugal (where only Genital Herpes and Viral Hepatitis were cited as STIs) and Poland (with no other examples than AIDS). Apart from AIDS, textbooks from Germany and Tunisia only mentioned Syphilis and Gonorrhoea. Genital Herpes was also well represented in 11 countries and Viral Hepatitis in 10 countries. The others STIs indicated in Table 4 were represented in almost half of 16 countries, except for Chancroid that was only cited in the Senegalese textbook (Nathan, 1996) and in a French one (Bordas, 2001). The textbook(s) of some countries (Senegal, Lithuania, Finland, Malta, Romania, and Cyprus) and some publishers from some other countries (France, Hungary, Italy, and Lebanon) gave a longer list of STIs with more scientific information than the other textbooks.

Regarding the number of images concerning STIs in textbooks, we also identified differences among the 16 countries. Considering the average number of images of STIs per textbook and per country (Figure 1), and the ratio AIDS/HIV images compared to other STIs images (Figure 2), three strategies could be identified:

- In Morocco, Tunisia, Senegal, and France, there was a larger total number of images, with more than six per textbook. In the case of Morocco, Tunisia, and France, there was a high percentage of AIDS/HIV images (from 68 to 84%). In the case of Senegal, however, 7 out of the 8 images were devoted to other STIs.
- Fewer images per textbook (four or less), with textbooks from some countries featuring more images relating to AIDS/HIV (Lebanon), others favouring images of other STIs (Finland, Portugal, Germany and Malta), and others including both AIDS/HIV and images of other STIs in approximately equal numbers (Romania, Hungary, and Italy).
- There was only one image per textbook in Lithuania, Cyprus, Estonia, and Poland. There was one image of AIDS/HIV in Lithuania textbook and one image of other STIs in the other three countries.

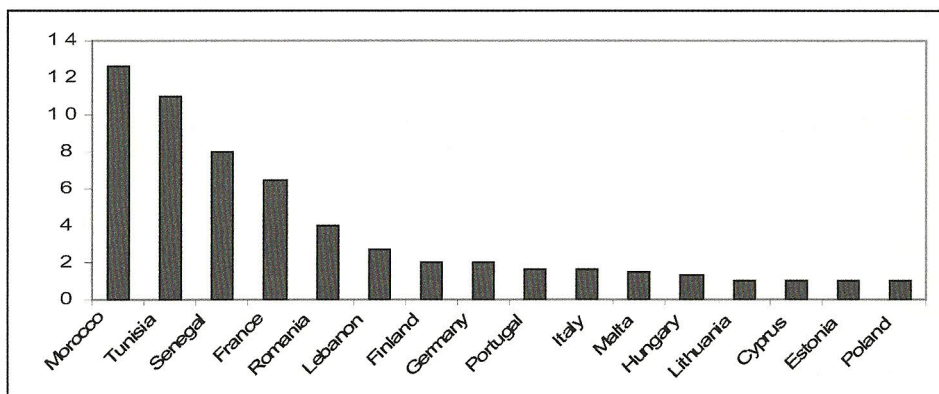


Figure 1. Average Number of Images of STIs per Textbook by Country.

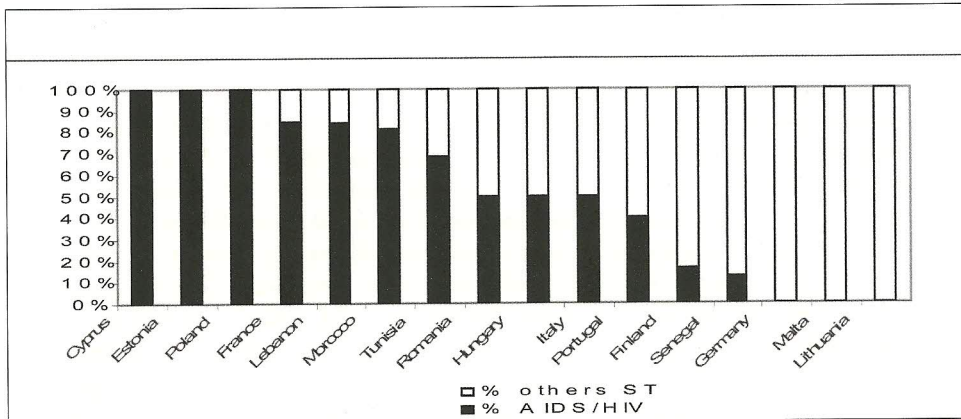


Figure 2. Average Percentages of Images Devoted to AIDS/HIV and Other STIs Images per Textbook by Country.

These results could be related to several parameters:

- For all 16 countries, the general emphasis on AIDS (in text and/or images) reflect the worldwide public health concern about this dangerous STI and the mobilization of most governments, following the global AIDS epidemic outbreak (Baron, 1999).
- Of the Francophone countries, the three countries France, Morocco, and Tunisia have textbooks with a large number of images (6 to 13 images of STIs per textbook) with at least 2/3 of them being devoted to AIDS/HIV. In other Francophone countries, like Lebanon and Senegal, the former has fewer images in its textbooks and the latter puts more emphasis on other STIs. The Senegalese textbook had 8 images relating to STIs, and was designed by a French editor (Nathan) to be used in different countries of Francophone West Africa. The important part devoted to STIs, in the text as well in the images, expressed a clear wish to treat and to prevent most of the STIs that represent a significant health risk in these West African countries. The textbook was not contextualized specifically for Senegal. All these francophone textbooks were well illustrated and were characterised by a specific structure, where the area occupied by the images was more than or as big as the area covered by the text. The general design of the textbook (part of the editorial strategy) could be an explanation for the large number of images found in some textbooks. We found a lot of images in the part devoted to STIs, because the textbook contained a lot of images in general.
- In contrast to the Francophone textbooks, the textbooks from Lithuania, Cyprus, Estonia, and Poland were designed with large areas of text and only few images. The results indicate that, on the average, only one image of STIs per textbook was found in the textbooks from these countries.
- Another possible explanation may relate to the dominant religion of each country. Some catholic countries had fewer STIs images in their textbooks (Italy, Malta, and Portugal), even though the general design of their text-

books devoted as much area to images as to the text.

- Another complementary or alternative explanation may be associated with the conceptions of teachers (and/or others actors of the educative system involved in textbooks production) and relates to the responsibility for health education (including sex education) that is assigned to the school. Initial results from the analysis of teachers' conceptions (data not shown) indicated two opposite conceptions. For teachers from some countries, such as France and other Francophone countries, health education should be taught at school by biology teachers, while, for other countries, health education should mainly be taught outside the school, and, when is taught at school, health professionals rather than teachers undertake this responsibility.

As for the type of images found in the textbooks under consideration, we have identified four main categories of the images in textbooks, as indicated in Figure 3.

- Medical images resulting from microscopic or macroscopic observation of the agent responsible for the disease (virus, bacteria...), an HIV infection, or the symptoms of the disease.
- Images representing a scientific conceptualization, for example, a HIV model or diagram.
- Illustrative images for prevention, such as, the reproduction of prevention posters used in the combat against STIs and specifically against AIDS.
- Charts or other data representing the incidence and some symptoms of STIs.

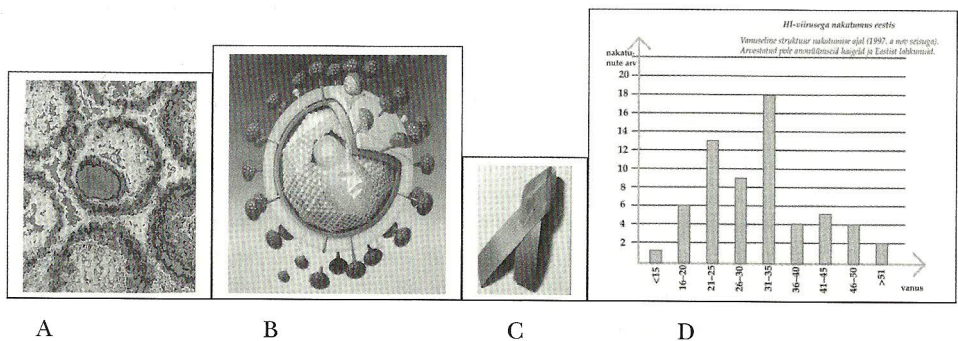


Figure 3. Categories of Images Found in Textbooks:

A – Biomedical (microscopic or macroscopic) images: 'Herpes virus' in *Descobrir a terra*, Areal editors, Portugal, 2004, pp. 65;

B – Model or diagram: 'HIV' in *Sciences de la vie et de la terre*, Nathan, France, 2003, pp.65 ;

C – Reproduction of symbols for the STIs combat: 'AIDS' in *Biologia 1*, Operon, Poland, 2004, p. 194;

D – Chart: 'HIV in Estonia' in *Tervisekasvatus põhikoolile*, Avita, Estonia, 1998, p. 157.

Overall, we frequently found one or more of these four types of images in the analyzed textbooks, but there were also interesting differences among the different countries.

Incidence of STIs in the Different Countries

The WHO (2001) estimated that each year more than 340 million new cases of common curable STIs (viral, bacterial, fungal or protozoa infections) appear among men and women between 15 and 49 years old, all over the world. These are distributed as follows: 174 million cases of Trichomoniasis (classified within Vaginitis), 92 million cases of Chlamydia, 62 million for Gonorrhoea, and 12 millions for Syphilis. The incidence of the new cases of these diseases varies according to the geographical areas concerned (Table 5). The countries involved in our research are listed in 4 areas (as defined by WHO, where Cyprus is not listed in Europe, but in North Africa and Middle East, for the incidence of diseases.

- Western Europe: Finland, France, Germany, Italy, Malta, and Portugal.
- Eastern Europe: Estonia, Hungary, Lithuania, Poland, and Romania.
- North Africa and Middle East: Cyprus, Lebanon, Morocco, and Tunisia.
- Sub-Saharan Africa: Senegal.

Table 5
Estimated New Cases of Curable STIs among Adults (15–49) by Area (WHO, 2001)

	Trichomoniasis	Chlamydia	Gonorrhoea	Syphilis
Western Europe	11 millions	5 millions	1 millions	140 000
Eastern Europe	13 millions	6 millions	3,5 millions	100 000
North Africa and the middle East	5 millions	3 millions	1,5 millions	370 000
Sub-Saharan Africa	32 millions	16 millions	17 millions	4 million

When textbooks included figures for STIs, they cited figures for the whole world with the exception of Finland and Lebanon, where reference to their own country was also made. Looking at the rates of incidence in these four areas, we can easily see that Trichomoniasis (Vaginitis) and Chlamydia are the most common STIs. Thus, it might appear surprising that only 11 of the 42 textbooks dealt with Chlamydia in their contents, and, likewise, 11 discussed Vaginitis. These two STIs were represented less frequently in images, with 6 images found for Chlamydia (in Finland, France, Lithuania, Lebanon, and Senegal) and 4 for Vaginitis (in France, Hungary, Lebanon, and Senegal).

Considering the presentation of AIDS, we can note that the importance of the textual treatment of STIs in the textbooks was not correlated with their rate of incidence, i.e., the most common STIs in a country did not receive the most attention. For instance, in a French textbook, one image (Figure 4) illustrated the incidence of each STI across the entire globe, and not specifically for France. Vaginitis caused by *Trichomonas* (Figure 4) is the most widespread infection, whereas AIDS appears last, suggesting that AIDS ('SIDA') is the least important, at least in numerical terms. Of course, it is the incurable nature of AIDS that makes it particularly important in terms of public health and sex education. The great importance of AIDS emerged mainly from the text and not from the images in the textbooks, as it is clearly indicated in Table 4 and Figure 2.

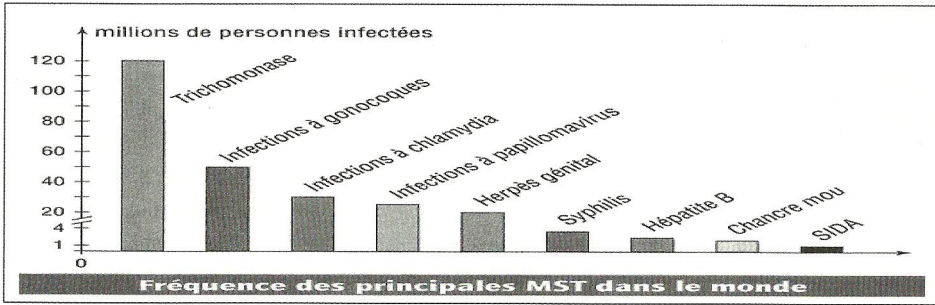


Figure 4. 'Frequencies of the Principal STIs in the World' in *Sciences de la Vie et de la Terre*, Bordas, France, 2001, p. 70

In Lithuania, the most common STIs were Syphilis and Gonorrhoea (Kuliešytė, 2002), but the textbook (Alma littera, 1999) illustrated STIs with statistics on Chlamydia in USA. Thus, we can note that the content of the textbooks dealing with STIs were, in general, not directly related to the epidemiological context of the country, although, there were some exceptions, such as:

- A Finnish textbook referring to genital warts (M.Kujala & T. Lehtonen, 2005, p. 75) and stating that "It is the most common sexually transmitted disease in Finland nowadays."
- Three Lebanese textbooks discussing AIDS presented estimated numbers of new HIV infections in young adults in Lebanon between 1984 and 1996 (Figure 5).
- One Estonian textbook writing about HIV infection, presented the distribution of the identified infection cases by age groups.

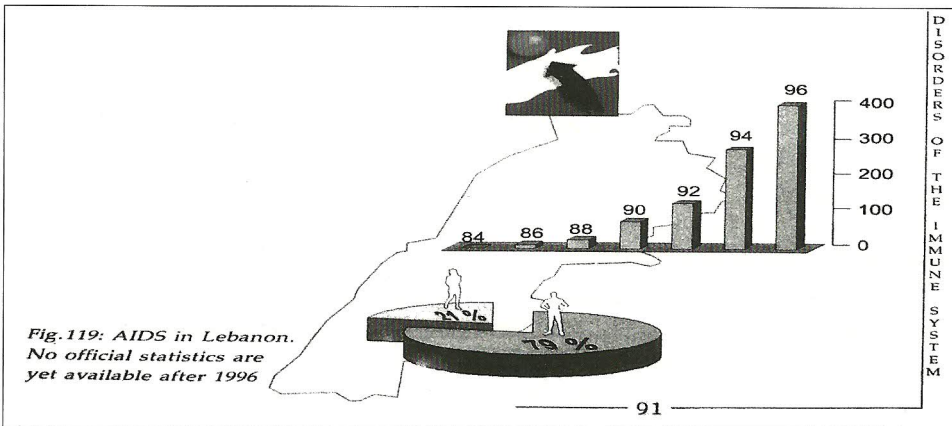


Figure 5. Image of a Lebanese Textbook about 'AIDS in Lebanon'. In *Life Science*, NCERD, Lebanon, 1999, p. 91

Scientific Contents Anchored in the Biomedical Model of Health

One textbook from France (Figure 6) and another from Senegal (Figure 7) presented a complete list of STIs, accompanied by only scientific information. The

STIs in the textbooks of these two countries were presented with information relating to (a) the name of the disease specifying the agent (i.e., bacteria or virus), (b) the list of the different symptoms for both men and women, (c) the list of treatment and complications, and (d) photographs of the superficial symptoms observable on the skin.

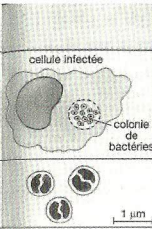
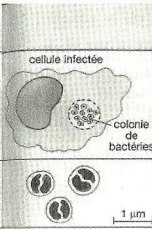


	Maladie (et germe responsable)		Principales manifestations		Traitement Complications
			chez l'homme	chez la femme	
B A C T É R I E S	Chlamydie (due à Chlamydia)		<ul style="list-style-type: none"> • Picotements ou brûlures de l'urètre. • Parfois, écoulement clair à l'extrémité de la verge. 	<ul style="list-style-type: none"> • Souvent, aucun symptôme. • Parfois, pertes blanches et démangeaisons vulvaires. 	<ul style="list-style-type: none"> • Antibiotiques. • Sans traitement précoce, risque de stérilité par atteinte d'organes génitaux profonds.
	Gonococcie ou "chaudepisse" (due au Gonocoque)		<ul style="list-style-type: none"> • Inflammation aiguë de l'urètre (brûlures intenses à l'émission d'urine). • Écoulement de pus. 	<ul style="list-style-type: none"> • Peu de symptômes. • Parfois, légères pertes vaginales. 	<ul style="list-style-type: none"> • Antibiotiques. • Mêmes risques de stérilité que pour chlamydie en l'absence de traitement précoce.
	Syphilis ou "vérole" (due au Tréponème)		<ul style="list-style-type: none"> • Apparition d'un chancre (plaie indolore et purulente) sur les organes génitaux, l'anus ou la bouche 2 à 6 semaines après la contamination. • 3 mois plus tard, apparition de taches roses sur le corps. 	<ul style="list-style-type: none"> • Apparition d'un chancre (plaie indolore et purulente) sur les organes génitaux, l'anus ou la bouche 2 à 6 semaines après la contamination. • 3 mois plus tard, apparition de taches roses sur le corps. 	<ul style="list-style-type: none"> • Antibiotiques. • Sans traitement, des années plus tard, atteintes nerveuses et viscérales (qui peuvent être mortelles).

Figure 6. Image of a French Textbook about STIs. ('Guide to the main STIs' in *Science de la vie et de la terre*, Bordas, France, 2001, p. 70–71. From Left to Right: Agent (bacteria, virus); Name of the infection; Symptoms (both on Man and woman); Treatment and Complications.)

In textbooks from Senegal and Tunisia, the list of symptoms was supplemented by shocking images of infected people illustrating the symptoms (Figures 7 and 8). However, we did not find any information about how some STIs, often with discrete symptoms (as compared to AIDS), like genital herpes, syphilis or soft chancre, can increase the risk of HIV infection by sexual means.

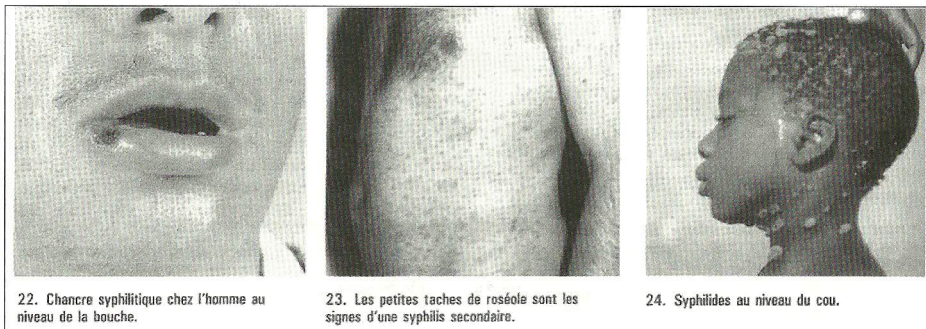


Figure 7. Image of a Senegalese Textbook about STIs. ('Syphilis' in *Géologie-Biologie*, Nathan, 1996, p. 175, textbook edited in France for Senegal)

The contents of textbooks from Senegal and Tunisia were particularly anchored in the biomedical model. They presented a list of each STIs associated with its symptoms for men and women, but neglected the health education perspective, as they did not take into account the ways through which STIs can and cannot be transmitted (especially for HIV transmission). They also emphasized the

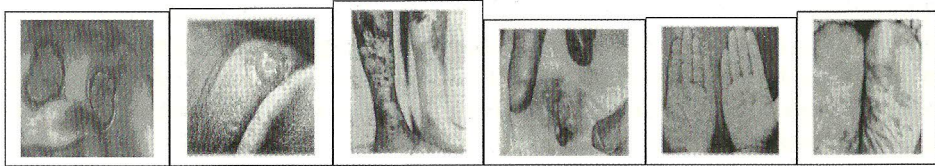


Figure 8. Image of a Senegalese Textbook about STIs ('Syphilis' in *Sciences Naturelles*, CNP, Tunisie, 2005, pp. 160–162. From Left to Right: Skin Ulceration in a Patient; Ulceration of the Penis; tertiary Ulceration; Ulceration on Female Genital Organ; Symptoms and Skin Rash)

high-risk populations. For more effective education on STIs, they should provide an explanation not only of the biological means of transmitting the infection (the information we did not find in these textbooks), but also the ways of avoiding this transmission. This information relating to means of prevention was needed in order to empower people to make well-informed decisions concerning their own health and the health of others, thereby reducing the incidence of the infection.

Only one Moroccan (Natural sciences, 1996), one Lebanese (Zakaria, 2002), one Portuguese (Areal editores, 2004) and one Italian (Fabbri editori, 2004) textbook took into account the ways in which HIV is not transmitted (Figure 9), by presenting images illustrating everyday activities that do not carry a risk of transmission. Here, we found illustrations of people in public places (street, bus, class, public swimming pool, toilets), as well as images of people eating together, shaking hands, or kissing.

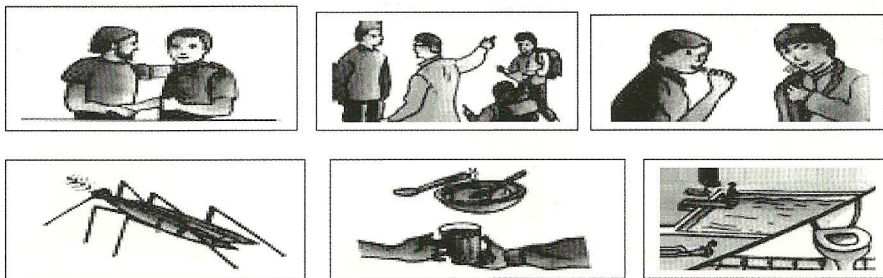


Figure 9. Image of a Lebanese Textbook about HIV transmission. ('HIV is not transmitted' in *Transmission de la Vie chez l'Homme*, Zakaria, 2002, Lebanon, p. 48. From Left to Right: HIV Is Not Transmitted by Touch, Greetings, a Kiss; at School, at Work; by a Cough, Sneezing; by Mosquitoes or Other Insects; by Food and Drinks; in the Washbasin, Toilet or Swimming Pool.)

Differences among Publishers from the Same Country

The subject of STIs was included in different parts of the textbooks in different countries. Sometimes, it was treated in chapters devoted to Human reproduction, and/or in chapters of immunology, or in a chapter dedicated to STIs, but this varied from one publisher to another. In Lebanon, for example, for the same school level, one publisher treated STIs in the human reproduction part of a textbook, another in a section specifically devoted to STIs, while a third presented STIs in the

Immunology section with a focus on HIV. Indeed, the Lebanese teaching context might explain this, because its official curriculum from 1998 advocated starting to teach human reproduction at the EB8 (12–13 years) school grade (décret n°10227, 1997, B.O. n°21, 1999), but the publication of the national textbook raised opposition. As it was argued by religious groups, textbook images incited perversion and threatened the core values of the Lebanese family. Religious and political groups (mostly Shiite and Druze Muslims) lobbied Minister of education directly, which finally withdrew the topic of human reproduction from the compulsory curriculum for the EB8 class (Baydoun, 2001; Germanos, 2004; Yammine, Khalil, & Clément, 2007). Nevertheless, each school can choose to teach this topic at the EB8 level (but it remains compulsory in the last class of the secondary school – for 16–17 years old students). We analyzed textbooks that had retained the topic of human reproduction, and thus became as annexes to the official textbooks, when human reproduction was deleted. These textbooks are still used in some private Christian establishments, which are guaranteed a freedom in what they teach by the Lebanese constitution (Harfouch & Clément 2001).

It is interesting to note that the choice of the textual content concerning STIs in textbooks also varied among publishers within a single country and for the same school level. In every country where more than one textbook was analysed, we found different lists of STIs in the different textbooks. This infra-national variation is particularly pronounced in France, Italy, and Hungary (Table 6). For example, one Hungarian textbook for 12 to 13 year-old students presents five STIs, whereas another publisher for the same school level presents only three STIs. In France, in textbooks for 14 to 15 year-olds, one publisher described seven STIs, and two other publishers' only one (HIV).

Table 6
STIs Cited in Text by Different Publishers in the Same Country:
Examples from France, Italy, and Hungary

Country	Publisher	School Level (Years old)	STIs cited in analysed textbooks						
			AIDS	Syphilis	Gonorrhoea	Genital Herpes	Viral Hepatitis	Vaginitis	Chlamydia
France	Bordas	14–15	•	•	•	•	•	•	•
	Nathan	14–15	•						
	Hatier	14–15	•						
Italy	Zanichelli	14–18	•	•	•				
	Edizioni	14–18							
	Scolastiche	14–18	•	•	•	•	•		•
	Loescher	14–18	•	•	•		•		
Hungary	Dr. Molnár	12–13							
	Katalin		•	•					•
	Nagyimhály	12–13							
	Mátyás		•	•	•	•		•	

In each country, we tried to determine the conformity between the country syllabus and the respective textbooks in terms of the topics of Human Reproduction and Sex Education. The choice of examples of STIs seemed to be done by the textbooks authors. For example, the French and German syllabuses mention exclusively the terms 'Sexually Transmitted Diseases' and 'AIDS,' without any more precise reference to any other STIs, but different French publishers chose different examples of STIs (e.g., Bordas publisher for 14 to 15 year-old students, see Table 5). There are two possible reasons behind this choice: (i) The incidence of the STIs with respect to the epidemiological data in the country, or in the world; and (ii) the seriousness of the disease in terms of epidemiological impact around the world (e.g., AIDS). The analyzed textbooks were not always clear concerning the justification of their choices. In France, publishers are under a double constraint, because they need to follow the official syllabus in terms of content and pedagogical style and yet respond to teachers' expectations. Some publishers seemed to be more 'classical' in their content and closely followed the syllabus, while others were more 'original' in terms of content.

The Use of Condoms in Textbooks

The Male Condom: When condoms were mentioned in textbooks as a means of contraception, we analyzed the images of both male and female condoms, and how these images referred to condom use: Rolled or unrolled condoms? Male condom unrolled over erect penis? Female condom inside the vagina? (Figures 10 and 11). In the 42 analyzed textbooks, only 26 presented male condoms for both the prevention of pregnancy and protection against STIs. In the 16 others textbooks, male condoms were only presented for the prevention of pregnancy as a mechanical (barrier) contraceptive method, even though it was known that condoms are the only contraceptive method proven to reduce the risk of STIs. Thus, they have a double role, serving both to prevent pregnancy and to protect against STIs.

We found that 28 textbooks illustrated the male condom using an image of a rolled condom. Two textbooks, from Malta and Finland (Figures 10 and 11), illustrated a condom on an erect penis, and one Tunisian textbook showed a schema of a condom on an erect penis inside the vagina with the ejaculation of the spermatozoa inside the condom (Figures 10 and 11). In the case of two other textbooks, French and Lebanese, we observed only a schema of the male condom inside the vagina but without the penis, and for the French one the condom was represented by a rectangular symbol, strengthening the hypothesis of a taboo concerning the representation of the penis inside the vagina. We also found another type of image in French textbooks that illustrated a condom on a penis-shaped object. In Lithuania, no images were found in the analyzed textbooks.

Images of male condoms found in textbooks (Figure 10) usually illustrated the condom as rolled in its container, as a rolled condom outside its container, or an unrolled condom. There were not any big differences between the countries, except for a Maltese and a Finnish textbook, which presented a longer description of how to use a condom:

An image found in a Maltese textbook (Figure 11) showed a schema representing how to place a male condom onto an erect penis. The caption explained

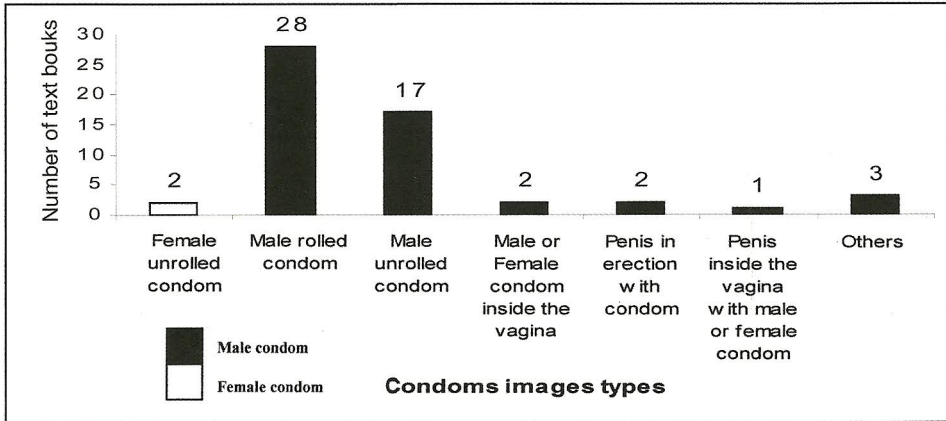


Figure 10. Types of Images Devoted to Male and Female condoms in the 42 Analysed Textbooks

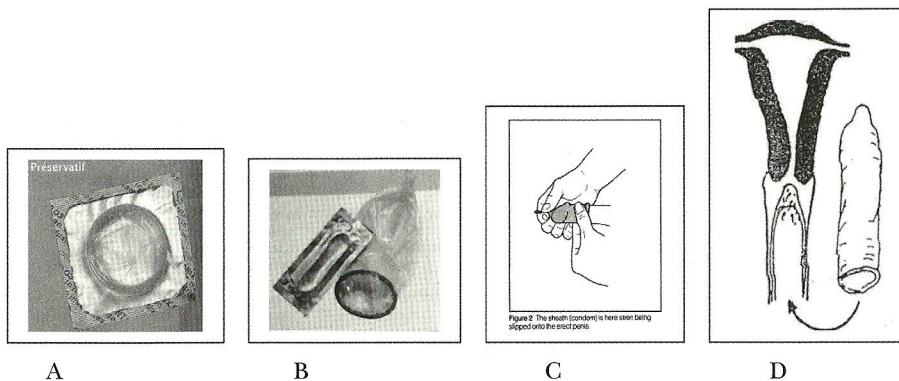


Figure 11. Textbook Images from Several Countries Showing Different Ways of Representing Male Condoms. (A – Rolled male condom in *Sciences de la vie et de la terre*, Nathan, France, 2003, p. 222; B – Unrolled male condom in *Descobrir a terra*, Areal editores, Portugal, 2004, p. 61; C – Condom placed over erect penis in *Biology for life*, Roberts, UK textbook used in Malta, 1986, p. 354; D – Male condom on erect penis inside the vagina in *Sciences naturelles*, CNP, Tunisia, 2005, p. 131.

that 'The sheath (condom) is here seen being slipped onto the erect penis' (Roberts, 1986, p. 354). Only one part of the penis was represented in the schema and the penis was apparently not connected to a body. In a previous study (Bernard & Clément, 2005) on a historical comparison of French textbooks, we have also found that, at the end of the 1980s, there were images illustrating how to put on a condom, which are no longer present in current French textbooks, indicating a return to certain values and indicating a taboo on sexual intercourse, avoiding images of the erect penis and images of the penis in a vagina. Since the Maltese textbook considered here was a United Kingdom textbook published in 1986 – from the same period as French textbook with instructions – we can assume that the time period of publication plays a major role in how the male condom is presented.

An image from a Finnish textbook (Figure 12) was also interesting in terms of sex education and, more generally, in terms of health promotion, as it transmitted a positive attitude encouraging a dialogue between the sexual partners. Moreover, the taboo of the erect penis was avoided by illustrating a condom on a raised finger (a metaphor for the penis).

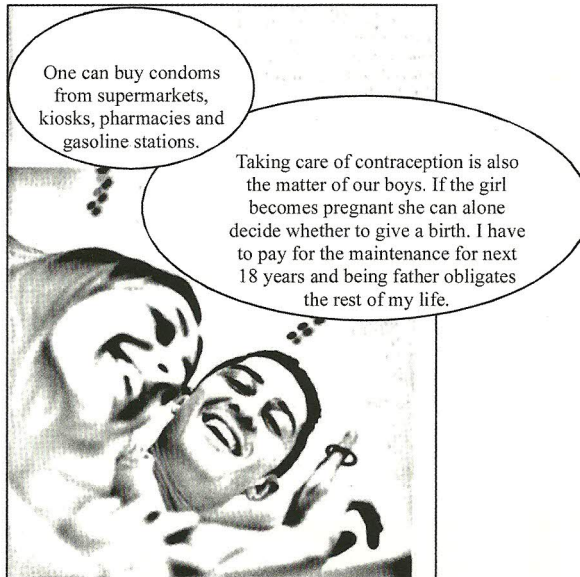
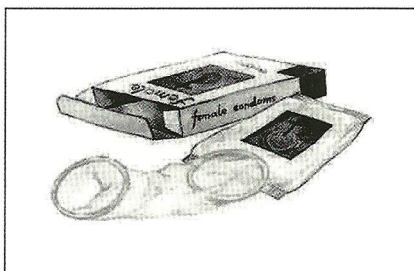
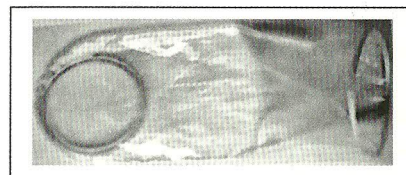


Figure 12. Picture Adapted from a Finnish Textbook (*Luonnonkirja 7–9: Ihminen*, Tanja Lehtonen – WSOY Oppimateriaalit Oy, 2006, Finland, p. 131 (Text Translated in English)

The Female Condom: Only 5 textbooks referred to the female condom in the text (see Figure 10), and two textbooks, from Portugal and Estonia, used images (Figure 13). Only the Estonian textbook (Avita, 1998, p. 106) contained a description of how to use the female condom, its advantages in protection against STIs as well as how to get one.



A



B

Figure 13. Textbook Images from Estonia and Portugal illustrating Unrolled Female Condoms. (A – Female unrolled condom in *Tervisekasvatus põhikoolile*, Avita, Estonia, p. 106; B – Female unrolled condom in *Descobrir a terra*, Areal editores, 2004, Portugal, p. 62).

Moreover, several textbooks in Lebanon and Senegal mixed the female condom up with the diaphragm. Thus, the Senegalese textbook (Nathan, 1996, p.168) stated: '*The female condom or diaphragm,*' and a Lebanese one (Le Pointier, 1999, p.25) explained:

Use of male condom: The male condom is considered as the best way to protect against STDs... The diaphragm is considered the female equivalent of the male condom.

Neither textbook specified that the diaphragm does not protect against STIs.

An effective combat against STIs started with prevention, i.e., accurate information about the risks of sexual practices and how to prevent them, including the correct and constant use of either male or female condoms (WHO & UNAIDS, 2000). The polyurethane female condom (FC1) was developed in the 1990s by the Female Health Company and provides a barrier method for women to use, particularly in situations where they are unable to insist on male condom use by their partner. The product was marketed worldwide and introduced into national STI and HIV prevention and family planning programmes in the late 1990s (WHO & UNAIDS, 2000). The female condom, like the male one, prevents not only pregnancy but also STIs. In part due to the relatively high cost of the female condom as a single use product, its wide-scale distribution by benefactors and national or local health programmes has been limited (WHO, 2002). The high cost of the female condom could explain why we found relatively little information about it in the textbooks, even though the Female Health Company has developed a new version of the female condom, which has similar physical characteristics, but it is made of synthetic latex in a considerably less expensive manufacturing process. Thus, even more than the cost, it seems that the absence of the female condom from textbooks means implicitly that it was not referred to, because it is less used, and less and less well integrated into practice than the male condom.

Educational Style and Moral Values in Textbooks

The Use of an Injunctive Style in the Content

We identified different categories of educational style used in the analyzed textbooks (see Table 2). The informative style was used in the content of textbooks in all countries. Nevertheless, for some countries (Morocco, Tunisia, Lebanon, and Germany), we identified the use of an injunctive or persuasive style specifically for the prevention of STIs. For instance the Moroccan textbook (Ifriquia Charq, 1996, p.160) used the following injunctions: '*Avoid illegal sexual intercourse, use the condom, have medical controls...*' And another one (Essalam Aljadida, 2005, p.139) stated:

...to avoid having several partners; to avoid falling pregnant while being infected by the AIDS virus; to avoid exchanging syringes; to adopt: fidelity in the couple, using condom, using sterilized sharp materials or single-use materials to treat in case of infectious diseases.

The German textbook (Klett, 1993, p. 105) used a persuasive and sometimes injunctive style too by stating:

It is necessary, if there is a suspicion of an infection and imperative after the first symptoms, to take a medical test' [...] 'The use of a condom during intimate contact and the modification of sexual behaviours are the only possibilities for stopping or, at least, slowing down the spread of the AIDS pandemic.' [...] 'Convention and tradition play an important role in the area of human behaviour and must, in any case, be respected.

In contrast, the participative educational style was almost absent from all the analyzed textbooks, whereas it might be more effective for developing students' competence with respect to behaviours involving a health risk. Education about STIs should also support positive attitudes, but we found this in only two textbooks, an Estonian one (Avita, 1998, p. 111):

Every person has a right to enjoy sexual life without undesired consequences
And a Maltese one (Roberts, 1986, p. 356):

With reliable methods of contraception available you might think that it's all right to have intercourse as young as you like, as often as you like and with as many people as you like. But that way you would run risks, both physical and mental, and may cause harm and distress to others. It is not always easy to cope with one's sexual feelings or to understand those of other people but parents, teachers and doctors are usually ready to help.'

As discussed above, the style and content of the English textbook still now used in Malta are probably due to the year of its publication (1986). Finally, when compared with all the other recent textbooks, the Estonian and Finnish textbook content seemed to be much closer to the model of health promotion. These textbooks were specifically concerned with health education rather than teaching biology, and that could explain this difference.

Moral Values and Hygienist Messages

In two Tunisian and Moroccan textbooks, the injunctive style was prevalent with sometimes implicit or explicit moral values: e.g., in the two Moroccan textbooks was explicitly stated: '*Avoid illegal sexual intercourse,*' '*Avoid having several partners,*' or '*Adopt fidelity in the couple*'

This was a clear example of how social values (fidelity, corresponding to the country's dominant religion) were didactically transposed into textbooks. '*Avoid illegal sexual intercourse*' implicitly means avoid illicit relations, such as, prostitution, adultery and homosexuality, and also (at least for women) sexual relations before marriage. These relations are prohibited by the Islamic religion and condemned by Moroccan law, and abstinence is the sexual practice privileged by the religion for the prevention of STIs (Dialmy, 1999).

Even if with more discretion and in a persuasive style, the German textbook (Klett, 1993, p. 105) also conveyed the message that human sexuality should only take place in the context of stable relationships: '*As a rule, the desire arises in adults for a durable and intensive relationship with a partner.*'

Besides this pro-marriage message, the German textbook was less explicitly

focused on the concept of family than the corresponding syllabus, which starts this subject with the topic '*Observance of the guidelines on family and sexual education*' and contained expressions, such as, '*The importance of the family*' revealing the conservative socio-cultural values that characterize the state of Bavaria, from which this textbook was selected. Both textbooks and syllabus were more centred on the family than on the individual, as the key nuclear component of society.

Some textbooks (in Morocco and Tunisia) also used injunctions in the text concerning the hygiene of the sexual organs. In the previous Moroccan textbook (Ifriquia Charq, 1996, p.160); it was stated: '*Maintain your body clean especially the sexual organs by washing them with water and soap before and after each sexual relation.*' Another Moroccan textbook, like the Tunisian one, highlighted similar hygiene practices. Nevertheless, to promote pupils' responsibility cannot be limited to convey injunctive and hygienist messages (Marzin, 1996). The use of an injunctive educational style associated to moral values is not found in Northern European countries where the Health promotion model was more developed.

Conclusion

Textbooks from Senegal, Tunisia, and France are still anchored in a biomedical model, providing a lot of scientific knowledge but disregarding the promotion of competencies for healthy sexual behaviour. At the opposite end, textbooks from Finland emphasise health promotion and sex education by empowering children or young people, and allowing them to gradually appropriate the means to make informed healthy choices, to adopt responsible behaviour for themselves, as well as for respecting the others. The Finnish textbooks represent a new era in Finnish basic education, which started in August 2006, when Health Education became an independent subject in the secondary school. Books appearing after this date follow the basic health education curriculum, which is based on health promotion and emphasizes pupils' knowledge of health and their literacy skills. Moroccan and Tunisian textbooks provide examples of how traditional values can be promoted along with knowledge of prevention by conveying injunctive moral content and hygienist messages. Significant interactions between scientific knowledge (K) and values (V) have been also found. Furthermore, values (V) and social practices (P) determine what is present (and how) in school textbooks. They clearly influence the approaches, since they explicitly determine the content of the syllabi, and they also seem to influence the strategies adopted by the textbook authors.

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List of analysed textbooks:

Geographical Area	Country	Age	Title of Textbook	Publisher
Europe	Cyprus	13-14	Anthropology- Health education	Ministry of Education & Culture, Middle Education, Administration, Curriculum & Development Service 2001
		15-16	Naturalistics	Ministry of Education, Direction of Middle Education & Service of Curriculum Development 2005
	Estonia	12-13	Tervisekasvatus põhikoolile	Avita 1998
		14-15	Bioloogia põhikoolile IV - Inimene Pärilikkuse alused - Eluslooduse süsteem ja evolutsioon	AS Bit 2003
	Finland	13-15	Luonnonkirja 7-9: Ihminen	Tanja Lehtonen – WSOY Oppimateriaalit Oy 2006
		13-15	Terveystietoa 1-3. Terveystietoa luokille 7-9	Markku Kujala & Tanja Lehtonen – Werner Söderström Osakeyhtiö 2005
	France	13-14	Sciences de la Vie et de la Terre, 4 ^{ème}	Nathan 1998
		14-15	Sciences de la Vie et de la Terre, 3 ^{ème}	Nathan 2003
		14-15	Sciences de la Vie et de la Terre, 3 ^{ème}	Hatier 2004
		14-15	Sciences de la Vie et de la Terre, 3 ^{ème}	Bordas 2001
	Germany	14-15	Natura, 9.Jahrgangsstufe, Biologie für Gymnasium Bayern	Ulrike Fehrmann 2005 (1993)
	Hungary	12-13	Biológia 8	Dr. Molnár Katalin 2004
		12-13	Biológia 8	Nagyimhály Mátyás 2004
		15-16	Biológia 3	Dr. Tóth Géza 2003
	Italy	11-13	Nuovo Libro delle Scienze - L'uomo e la Vita C	Garzanti Scuola 2004
		11-13	Sperimentare Scienze - L'uomo e l'Ambiente - Vol D	Edizione Il Capitello 2001
		11-13	La Materia e la Natura - L'uomo	Fabbri Editori 2004
		14-18	Biologia. Diversità e Unità dei Viventi Moduli B - Dalla Cellula ai Geni - C - Il Corpo Umano Sperimentare Scienze - L'uomo e l'Ambiente - Vol D	Zanichelli 2006
		14-18	Il Mondo della Natura. Il punto di vista della Biologia - Module F - Il Corpo Umano	Edizioni Scolastiche – Bruno Mondadori 1998
		14-18	VIVERE. Percorsi modulari di Biologia. Vol. D – Ereditarietà e Riproduzione	Loescher 2001
Lithuania	17-18	Biologija –II-a knyga	Alma littera 1999	
Malta	13-16	GSCE Biology	D.G. Mackean 1988	
	13-16	Biology for Life	M.B.V. Roberts 1986	
Poland	16-18	Biologia 1	Operon 2004	
	10-11	Magia da vida	Porto Editora 2005	
Portugal	13-14	Descobrir a Terra	Areal Editores 2004	
	16-17	Terra, Universo da Vida	Porto Editora 2005	
	13-14	Biologie-manual pentru clasa a VII-a	Corint 2000	
Romania	13-14	Biologie-manual pentru clasa a VII-a	Corint 2000	
North Africa and the Middle East	Lebanon	12-13	Life and Earth Sciences Anthropology-Health education	Habib 1999
		12-13	A la découverte des sciences de la vie et la terre - Transmission de la vie chez l'Homme	ΣSciences- Librairie Khoury 2002
	12-13	Life Sciences	Le Pointier 1999	
	15-16	Sciences de la vie	Secondary Publishing Company 2000	
	15-16	Sciences de la vie	Le Pointier 1999	
	16-17	Life Sciences	Center for Educational Research and Development 2002	
	16-17	Sciences de la vie	Le Pointier 2000	
	Morocco	13-14	AL MOUFID in Life and Earth Sciences	Dar Attakafa 2004
		14-15	Fi Rihab Life and Earth Sciences	Librairie Essalam Aljadida – Addar Alaalamia Likitab 2005
	Tunisia	17-18	Natural Sciences	Ifrikaia Charq 1996
14-15		Sciences Naturelles	Centre National Pédagogique 2005	
18-19		Sciences Naturelles	Centre National Pédagogique 2005	
Sub-Saharan Africa	Senegal	14-15	Géologie – Biologie	Nathan 1996