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Analysis of European Medical Schools' Teaching Programs

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Aim. To compare the teaching programs of European medical schools with the minimum requirement medical curriculum recommended by the European University Association.

Methods. Information on the curricula was gathered from the websites of 32 medical schools from 18 European countries. The data collected were the number of courses and proportion of each course in the study plan according to the class hours or credits. Each curriculum was compared with the standard medical curriculum recommended by the European University Association. Courses were clustered in 3 large groups: preclinical, clinical, and public health.

Results. The proportion of preclinical subjects was the highest at the Medical Schools in Brussels, Dublin, Milan, and Madrid, and the lowest in Athens, London, Lund, and Bucharest. The proportion of clinical subjects was the highest at the Medical Schools in London, Bucharest, and Genoa, and the lowest in Brussels, Dublin, and Milan. Croatian Medical Schools (Zagreb, Osijek, Split, and Rijeka) and the Medical School in Milan had the highest proportion of public health and humanistic subjects in their curricula. Neuroscience was found in less than half of the analyzed medical school curricula, and Psychology in about two-thirds. Nuclear Medicine course was found only in 7 out of 28 schools. Intensive Care, Anesthesiology, and Urology courses were found in less than half of the curricula. Two-thirds of analyzed curricula offered Primary Care course within the group of public health and humanistic courses. Epidemiology and Social Medicine courses were taught at more than half, and Anthropology at one-sixth of the medical schools.

Conclusion. The lack of uniform curriculum in European medical schools makes mutual accreditation and mobility of students very difficult. Great deviations from the standard, ie, medical curriculum recommended by the European University Association, question the possibility of a quick medical curricula reform.

Key words: *curriculum; education, medical; Europe; schools, medical*

The current political, economic, and scientific trends in Europe resulted in the need to reform the European higher education by connecting European universities, making their curricula compatible, and setting common objectives. The reform has begun with a series of conferences: Lisbon 1997, Sorbonne Declaration 1997, and Bologna 1998 and 1999, where the main trends in European higher education were set (1,2). The Bologna Declaration, a pledge by 29 countries to reform their higher education systems, marks a turning point in the development of European higher education (1,2). The aims stated in the Declaration refer to reaching comparability and transparency of all higher education programs in European countries and implementation of European Credit Transfer System (ECTS) (3,4).

ECTS is made upon study plan information accessibility and based on "student workload coefficient", which is assigned to each course to show the load of academic work a student has to do during that course (standardized as 30 credits per semester) (5). The Bologna process includes both political and academic efforts in realizing two main projects – accreditation and quality assurance (1,2,5).

Beside these general reforms, the aims of medical education reform were stated in 3 key documents: Physician for the 21st Century (6), Tomorrow's Doctors (7), and Blueprint 1994: Training of Doctors in the Netherlands (8). They all recognize, in one way or the other, general dissatisfaction with the current situation in medical education. The main objections stated in the documents concern the absence of the generally adopted goals for undergraduate studies, large differences among European medical schools, unequal work loads in study programs, and different proportions of the clinical part of the curricula (6-8).

We analyzed the similarities and differences in the curricula of 32 university medical schools in 18 European countries to assess the amount of changes and improvements in curricula needed to fulfill the aims of the reform and achieve mutual comparability.

Material and Methods

We analyzed 32 medical school study plans from 18 European countries. Information was gathered from the web pages of the medical schools in the period from November 2001 to May 2002. We examined all accessible web pages of medical schools from 25 European countries listed at *http://www.zbmed.de-a_dig it-kliniken-klinik-europa.html.url,* the official website of the German National Library of Medicine (Deutsche Zentralbibliothek für Medizin), which contains the links to the websites of 301 Medical Schools in Europe. The study included medical schools whose curriculum was found on the official web page and expressed in either class hours or credits. The data collected were the number and proportion of each course in the study plan, according to assigned class hours or credits. Each curriculum was compared with the standard curriculum recommended by the European University Association (9,10). The difference in the number of class hours of each course between the standard curriculum and the analyzed curricula was calculated.

Courses were clustered in 3 large groups: preclinical, clinical, and public health. The "public health" group included social and humanistic courses (Ethics, Foreign Language, and Sociology). Clinical courses were divided into two sub-groups: clinical-internal medicine and clinical-surgical. All courses from the curricula were compared, regardless of the means of teaching or type of examination (written, oral, or quiz). In the group of 32 medical schools, 4 were excluded from the analysis of the clinical curriculum because the data at their websites were incomplete. Out of 32 schools included in the study, 25 had course workload expressed in class hours and 7 in credits. There were also many differences in course names, despite the fact that they taught on the same subject. For better comparison, all courses with the same subject were merged under a single name (e.g., kidney, heart, and gastrointestinal diseases were considered as a course in Internal Medicine).

Results

The total number of class hours differed among medical schools, ranging from 8,229 in Helsinki, Finland, to 2,752 in Brussels, Belgium (Fig. 1). The median total number of class hours was 4,267 at medical schools where courses were expressed in class hours. The total number of class hours recommended by the European University Association was 4,979.

The median total number of class hours of preclinical subjects was 1,740, ranging from 989 in Marseilles, France, to 3,500 in Helsinki (Table 1). The median total number of class hours of clinical courses was 2,169, ranging from 788 in Brussels to 4,761 in Helsinki (Tables 2 and 3). The median total number of class hours assigned to public health subjects was 358, ranging from 60 in Paris V, France, to 740 in Split, Croatia (Table 4).

The proportion of preclinical subjects was the highest at the Medical Schools in Brussels, Dublin, Milan, and Madrid, and the lowest in Athens, London, Lund, and Bucharest (Fig. 1). The proportion of clinical subjects was the highest at the Medical Schools in London, Bucharest, and Genoa, and the lowest in Brussels, Dublin, and Milan. Curricula of Croatian Medical Schools in Zagreb, Osijek, Split, and Rijeka were in the group with the highest proportion of public health and humanistic subjects (Table 4). Only the Medical School in Milan had higher proportion of public health and humanistic subjects. Interestingly, the Medical School in London did not offer any courses in humanistic and public health subjects.

All medical schools had Anatomy, Biology, and Physiology courses included in their curricula (Table 2). Most medical schools had courses in Physics, Histology, Microbiology, Pharmacology, and Propedeutics. Neuroscience was found in less than half of the analyzed medical schools' curricula, and Psychology in about two-thirds (Table 1).

All medical schools had Pediatrics, Internal medicine, Surgery, and Gynecology courses in their curricula. The course in Nuclear Medicine was rarely found in the analyzed curricula, only in 7 out of 28 schools (Table 2). Intensive Care, Anesthesiology, and Urology courses were found in less than a half of the curricula (Table 3).

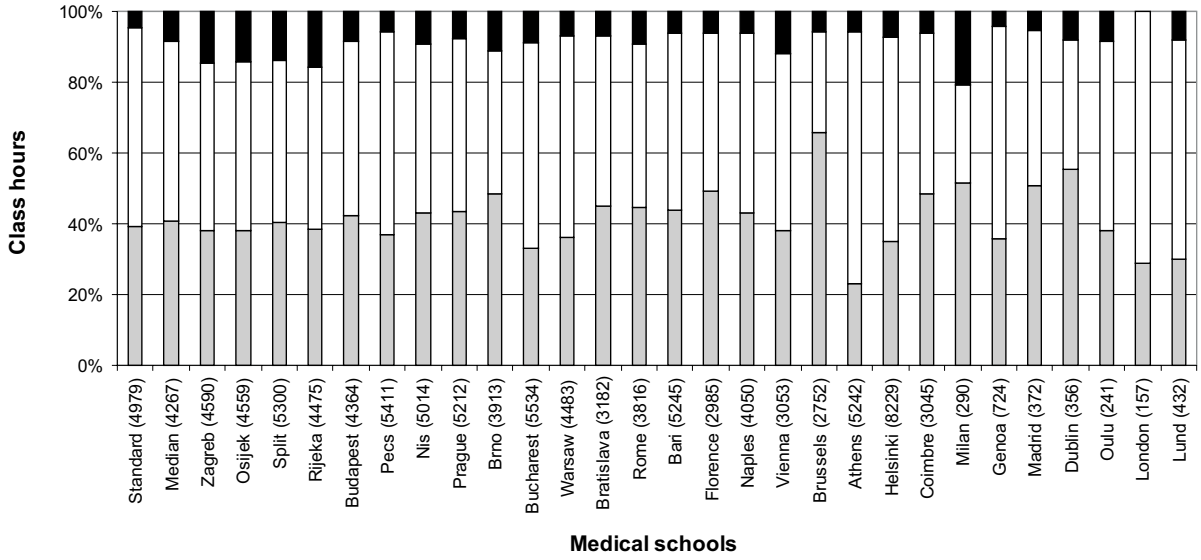

Figure 1. Preclinical (gray), clinical (white), and public health (black) courses in the medical curricula of 28 European medical schools, the median of analyzed curricula, and the standard recommended by the European University Association (9,10). Medical schools in Milan, Genoa, Dublin, London, and Lund express their curricula in national credits, whereas schools in Madrid and Oulu used European Credit Transfer System (ECTS).

Table 1. Number of class hours of preclinical courses at 32 European medical schools and the difference from the standard recommended by the European University Association (9,10)

School	Course													
	Medical Physics (206)*	Chemistry/ Biochemistry (330)	Biology (150)	Anatomy (292)	Histology/ Embryology (148)	Physiology/ Imunology (192)	Patoanatomy (210)	Pathophysiology (164)	Microbiology (134)	Pharmacology (132)	Psychology	Neuroscience	Total
Zagreb, Croatia	90† (-116)‡	240 (-90)	120 (-30)	210 (-82)	135 (-12)	210 (+18)	180 (-30)	135 (-29)	90 (-44)	135 (+3)	50	100	1745
Osijek, Croatia	90 (-116)	240 (-90)	120 (-30)	180 (-112)	135 (-12)	210 (+18)	180 (-30)	150 (-14)	90 (-44)	135 (+3)	60	100	1740
Split, Croatia	50 (-156)	240 (-90)	180 (+30)	450 (+10)		280 (+88)	210 (0)	170 (+6)	130 (-4)	150 (+18)	50	150	2150
Rijeka, Croatia	90 (-116)	240 (-90)	120 (-30)	180 (-112)	60 (-88)	230 (+38)	210 (0)	120 (-44)	90 (-44)	135 (+3)	60	120	1715
Budapest, Hungary	133 (-73)	252 (-78)	84 (-66)	420 (-20)		315 (+123)	196 (-14)	112 (-52)	98 (-36)	147 (+15)	56		1841
Pecs, Hungary	112 (-94)	322 (-8)	154 (-4)	364 (-76)		308 (+116)	238 (+28)	140 (-24)	126 (-8)	126 (-6)	112		2002
Niš, Serbia and Montenegro	105 (-101)	330 (0)	120 (-30)	270 (-22)	165 (+17)	270 (+78)	285 (+75)	195 (+31)	195 (+61)	165 (+33)	with Psychiatry		2160
Prague, Czech Republic	90 (-116)	360 (+30)	135 (-15)	280 (-12)	165 (+17)	345 (+153)	240 (+30)	180 (+24)	120 (-14)	150 (+18)	150		2260
Brno, Czech Republic	75 (-131)	225 (-80)	135 (-15)	240 (-52)	150 (+2)	278 (+86)	210 (0)	150 (-14)	120 (-14)	150 (+18)	45	83	1891
Bucharest, Romania	64 (-142)	192 (-138)	160 (+10)	352 (+60)	144 (-4)	304 (+112)	128 (-82)	128 (-36)	160 (+26)	128 (-4)			1837
Warsaw, Poland	30 (-176)	280 (-50)	30 (-120)	240 (-52)	110 (-38)	297 (+105)	210 (0)	90 (-74)	135 (+1)	145 (+13)	30		1628
Bratislava, Slovakia	72 (-134)	216 (-114)	108 (-42)	140 (-152)	132 (-16)	216 (+24)	192 (-18)	132 (-32)	108 (-24)	96 (-36)	24		1436
Paris IV, France	178 (-28)	165 (-165)	170 (+20)	106 (-186)	125 (-23)	159 (-33)	36 (-174)		90 (-44)	44 (-88)	15	36	1154
Paris V, France	131 (-75)	150 (-180)	388 (+238)	103 (-189)	60 (-88)	126 (-66)	70 (-140)		79 (-55)	57 (-75)		89	1253
Nice, France	140 (-66)	186 (-144)	69 (-81)	190 (-102)	103 (-45)	193 (+1)	49 (-61)		109 (-25)	199 (+67)	32	47	1356
Marseilles, France	95 (-111)	150 (-180)	105 (-45)	157 (-135)	110 (-38)	169 (-23)	53 (-57)		94 (-40)	28 (-104)	15		976
Rome, Italy	54 (-152)	197 (-133)	158 (+8)	136 (-156)	84 (-64)	290 (+98)	280 (+70)		259 (+125)	95 (-37)	32		1703
Bari, Italy	150 (-56)	400 (+130)	175 (+25)	275 (-17)	125 (-23)	400 (+208)	380 (+170)	100 (-64)	150 (+16)	150 (+28)			2305
Florence, Italy	63 (-143)	190 (-140)	70 (-80)	137 (-155)	63 (-85)	174 (-22)	258 (+48)	314 (+125)	91 (-43)	115 (-17)			1475
Naples, Italy	350 (+45)	400 (-80)		400 (-40)		150 (-42)	350 (+140)	100 (-64)					1750
Vienna, Austria			285 (+135)	120 (-172)		460 (+268)				with Propedeutics	100	200	1165
Brussels, Belgium	160 (-46)	390 (+60)	155 (+5)	260 (-32)	165 (+17)	330 (+138)	40 (-170)	with Physiology	94 (-40)	105 (-23)	40	40	1809
Athens, Greece	89 (-117)	18 (-147)	97 (-53)	224 (-216)		208 (+16)	155 (-55)	116 (-48)	115 (-19)	108 (-24)	36		1211
Helsinki, Finland		360 (+30)	200 (+50)	280 (-12)	240 (+92)	848 (+656)	246 (+36)		232 (+98)			376	2875
Coimbre, Portugal	150 (-56)	240 (-240)		510 (-122)			405 (+195)	225 (+61)		120 (-12)			1650
Milan, Italy§	6	36	24	16	7.5	22.5	7.5	12	6	4.5			149
Genoa, Italy§	40	40		40		40	70			30			260
Madrid, Spain‖	6	24	8	31	24	34	31	3	8	8	7		189
Dublin, Ireland§	11	35	5	33	21	24	24		14	24			197
Oulu, Finland‖		13.5	7.5	12.5		14.25	10.5	6	12.75	9	3	5.25	92.25
London, UK§	6	6	7	6		13						7	45
Lund, Sweden§			25.5	15		27	22.5	12	15			12	129

*The number of class hours as recommended by the European University Association (9,10).
†The number of class hours in the current curriculum of the school.
‡The number in brackets indicates the number of class hours below (-) or above (+) the recommendation of the European University Association (9,10).
§Medical schools whose curriculum is expressed in national credits.
‖Medical schools whose curriculum is expressed in European Credit Transfer System (ECTS).

In the group of public health and humanistic courses, two-thirds of analyzed curricula offered Primary Care course. At more than half of the medical schools Epidemiology and Social Medicine courses were taught, and one-sixth of the curricula included Anthropology course (Table 4).

Discussion

Currently, the whole Europe is undergoing extensive reforms in higher education, aiming at elimination of the remaining obstacles to the free mobility of students, teachers, and scientists. One path towards that goal is mutual accreditation and curriculum coordination (5). Our study showed that the curricula in European medical schools greatly differed.

The schools differed in both the number of class hours/credits and the names of the courses. The European University Association recommends 2,022 class hours for preclinical courses, 2,785 class hours for clinical, and 236 class hours for public health courses (9,10). In most schools, the closest to the recommendations was the public health timetable, whereas preclinical and clinical courses were mostly below the recommended standard.

Each school out of 32 in the study had a different number of mandatory courses. However, if one course was not included in the curriculum it did not mean that students have not learnt about it. It is possible that a smaller course was thematically overlapping with another, larger course (e.g., teaching Neuroscience as a part of Physiology, Anatomy, and Neurology courses, or teaching Nuclear Medicine and Oncology as a part of Internal Medicine course). Only two-thirds of the curricula included Psychology as a separate course, although this was recommended by the Advisory Committee on Medical Training of the European Union (EU) (11), together with Geriatrics and Palliative Care. We found Geriatrics in only 20% of the curricula and no Palliative Care courses at all.

Data used in this study were found on the available web pages of medical schools in the period from November 2001 to May 2002. Therefore, some data might have already been changed by now, especially

Table 2. Number of class hours of clinical-internistic courses at 28 European medical schools and the difference from the standard recommended by the European University Association (9,10)

	Course												
School	Internal medicine (892)*	Pediatrics (90)	Radiology/ Laboratory med (96)	Infectious diseases (96)	Dermato-logy (108)	Neurology (139)	Psychiatry (96)	Forensic medicine (90)	Nuclear medicine	Onco-logy	Clinical genetics	Rehabili-tation	Prope-deutics
Zagreb, Croatia	380† (-512)‡	240 (+150)	75 (-21)	135 (+39)	75 (-33)	125 (-14)	90 (-6)	60 (-30)	30	30		45	135
Osijek, Croatia	380 (-512)	240 (+150)	75 (-21)	135 (+39)	75 (-33)	125 (-14)	90 (-6)	60 (-30)	39	30		45	135
Split, Croatia	480 (-412)	240 (+150)	110 (+14)	100 (+4)	80 (-28)	105 (-34)	105 (+9)	50 (-40)	30				180
Rijeka, Croatia	360 (-532)	240 (+150)	75 (-21)	120 (+24)	60 (-48)	120 (-19)	90 (-6)	60 (-30)	30	30		30	120
Budapest, Hungary	364 (-528)	240 (+150)	49 (-47)		56 (-52)	218 (+79)	218 (+122)	70 (-20)		24		8	196
Pecs, Hungary	875 (-12)	357 (+267)	70 (-26)	56 (-40)	70 (-38)	238 (+99)	238 (+142)	84 (-6)			14		98
Niš, Serbia and Montenegro	494 (-398)	225 (+135)	60 (-36)	113 (+17)	75 (-33)	98 (-41)	113 (+17)	90 (0)	30	36		76	135
Prague, Czech Republic	660 (-232)	150 (+60)	30 (-66)	90 (-6)	60 (-48)	90 (-49)	90 (-6)	30 (-60)	30	30		12	225
Brno, Czech Republic	280 (-612)	150 (+60)	75 (-21)	60 (-36)	45 (-63)	75 (-64)	75 (-21)	40 (-50)		30			195
Bucharest, Romania	697 (-195)	345 (+255)	60 (-36)	205 (+109)	60 (-48)	90 (-49)	120 (+124)	60 (-30)		15		90	352
Warsaw, Poland	440 (-452)	345 (+255)	90 (-6)	120 (+24)	90 (-18)	120 (-19)	143 (+47)	55 (-35)	45	45		30	120
Bratislava, Slovakia	276 (-616)	120 (+30)	48 (-48)	48 (-48)	60 (-48)	72 (-67)	72 (-24)	36					216
Rome, Italy	383 (-509)	286 (+196)	52 (-44)	34 (-62)	32 (-76)	40 (-99)	38 (-58)	85 (-5)		50		24	59
Bari, Italy	755 (-207)	200 (+110)	200 (+104)	90 (-6)	50 (-58)	100 (-39)	125 (+29)	90 (0)		50			200
Florence, Italy	468 (-374)	87 (-3)	53 (-41)			80 (-59)	53 (-43)			112	9	80	
Naples, Italy	875 (+33)	200 (+110)	400 (+304)			75 (-64)							
Vienna, Austria	225 (-667)	105 (+15)	60 (-36)		75 (-33)	120 (-19)							361
Brussels, Belgium	185 (-707)	40 (-50)	65 (-31)	36 (-60)	25 (-83)	30 (-109)	25 (-71)	10 (-80)		21		12	90
Athens, Greece	804 (-38)	542 (+432)	102 (+8)		124 (+16)	232 (+93)	252 (+156)	80					
Helsinki, Finland	1374 (+532)	446 (+336)	49 (-47)	176 (+80)	112 (+4)		266 (+170)	90		80	80	40	620
Coimbre, Portugal	120 (-722)	150 (+40)		270 (+174)		105 (-130)							420
Milan, Italy§	19	5	4	6	3.3	6	5						4
Genoa, Italy§	130	20	15			15							60
Madrid, Spain‖	with Surgery 58	22	10		7		9	9				4	4
Dublin, Ireland§	36	13					13	6					3
Oulu, Finland‖	23.25	18.75	5.25		4.5	5.25	11.5	4.5		3.75	3	2.25	8.75
London, UK§	with Surgery 67	15				15							
Lund, Sweden§	78	15		13.5	40.5		16.5	15					16.5

*The number of class hours as recommended by the European University Association (9,10).
†The number of class hours in the current curriculum of the school.
‡The number in brackets indicates the number of class hours below (-) or above (+) the recommendation of European University Association (9,10).
§Medical schools whose curriculum is expressed in national credits.
‖Medical schools whose curriculum is expressed in European Credit Transfer System (ECTS).

Table 3. Number of class hours of clinical-surgical courses at 28 European medical schools and the difference from the standard recommended by the European University Association (9,10)

	Course										
School	Surgery/ Pediatric surgery (818)*	Gynecology/ Obstetrics (264)	ENT (48)	Ophtal-mology (48)	Intensive care/ Emergency	Aneste-siology	Uro-logy	Orthop-edics	Neuro-surgery	Dentistry/ Maxilofacial surgery	Sum of clinical courses¶
Zagreb, Croatia	185† (-633)‡	255 (-9)	75 (+27)	75 (+27)		30	45	60	with Neurology	30	2175
Osijek, Croatia	185 (-633)	255 (-9)	75 (+27)	75 (+27)		30	30	60	with Neurology	30	2169
Split, Croatia	220 (-598)	240 (-24)	90 (+42)	90 (+42)	80	40	50	120			2410
Rijeka, Croatia	170 (-648)	240 (-24)	75 (+27)	75 (+27)		25	45	60		30	2055
Budapest, Hungary	177 (-641)	292 (+28)	42 (-6)	56 (+8)		35	49	42		28	2158
Pecs, Hungary	378 (-443)	322 (+58)	56 (+8)	42 (-6)		42	49	56	28	28	3101
Niš, Serbia And Montenegro	434 (-384)	240 (-24)	60 (+12)	75 (+27)						30	2384
Prague, Czech Republic	390 (-428)	240 (-24)	60 (+12)	60 (+12)	60		30	30	30	30	2547
Brno, Czech Republic	210 (-608)	135 (-129)	60 (+12)	45 (-3)	45			30		30	1580
Bucharest, Romania	477 (-341)	253 (-11)	60 (+12)	45 (-3)	120		82	82			3213
Warsaw, Poland	330 (-488)	260 (-4)	60 (+12)	60 (+12)		60	30	60	30	15	2548
Bratislava, Slovakia	164 (-654)	180 (-84)	48 (0)	48 (0)		48	30	30		24	1520
Rome, Italy	244 (-574)	206 (-58)			100		22	76	24		1755
Bari, Italy	300 (-518)	150 (-114)	50 (+2)	50 (+2)		100		50		50	2610
Florence, Italy	227 (-591)	63 (-201)	115 with Dentistry		108						1331
Naples, Italy	250 (-568)	150 (-114)			100						2050
Vienna, Austria	225 (-593)	105 (-159)	60 (+12)	60 (+12)	105	22					1523
Brussels, Belgium	94 (-724)	62 (-202)	14 (-34)	20 (-28)	14	5	15	10	12		788
Athens, Greece	616 (-202)	524 (-260)	154 (+106)	118 (+70)			92	92			3732
Helsinki, Finland	140 (-678)	380 (+116)	218 (+170)	112 (+64)		94		564			4761
Coimbre, Portugal	360 (-458)	120 (-144)									1545
Milan, Italy§	14.5	5			4			5			80.8
Genoa, Italy§	130	15			25						434
Madrid, Spain‖	with Internal Medicine	18	7	7		4					163
Dublin, Ireland‖	36	13	5	5							130
Oulu, Finland‖	16.5	11.5	7.5	4.5		0.75					128.5
London, UK§	with Internal Medicine	15									112
Lund, Sweden§	48	12	13.5								268.5

*The number of class hours as recommended by the European University Association (9,10).
†The number of class hours in the current curriculum of the school.
‡The number in brackets indicates the number of class hours below (-) or above (+) the recommendation of the European University Association (9,10).
§Medical schools whose curriculum is expressed in national credits.
‖Medical schools whose curriculum is expressed in European Credit Transfer System (ECTS).
¶Sum of courses in Tables 2 and 3.

Table 4. Number of class hours of public health and humanistic courses at 28 European medical schools and the difference from the standard recommended by the European University Association (9,10)

	Course														
School	Primary care/ Preventive (104)*	Medical management (96)	Epidemiology (36)	Ecology	Occupational health	Public health/Social medicine	Sociology	Ethics	History of medicine	Anthropology	Research methods	Geriatry	Informatics/ Statistics	Language	Total
Zagreb, Croatia	105† (+1)‡	90 (-6)	45 (+9)		105	60	30	30	15		20		50	120	670
Osijek, Croatia	105 (+1)	70 (-26)	45 (+9)		105	60	30	30	15		20		50	120	650
Split, Croatia	180 (+76)	60 (-36)	50 (+14)	20	20	30		70	30		70		90	120	740
Rijeka, Croatia	60 (-44)		75 (+39)	60	30	60	60	120	15		45		60	120	705
Budapest, Hungary	151 (+47)	12 (-84)				74	28	28		28		16	28		365
Pecs, Hungary	94 (-10)					126							28	60	308
Niš, Serbia and Montenegro			95 (+59)	110	65	80	45	15					60		470
Prague, Czech Republic	90 (-14)		60 (+24)	15	30	75		90					45		405
Brno, Czech Republic		45 (-51)	0 (-36)			45	30	60					30	232	442
Bucharest, Romania			0 (-36)	90		45	30	30	32				77	180	484
Warsaw, Poland	36 (-68)	45 (-51)	15 (-21)	30			30	30	30	30			31	30	307
Bratislava, Slovakia	54 (-50)		24 (-12)					24						124	226
Paris IV, France			19 (-27)			60							30	154	263
Paris V, France						60									60
Nice, France			80 (+44)	15			26					20	39	180	360
Rome, Italy					60	105			13	12		50	118		358
Bari, Italy					60	100					120	50	with Physics		330
Florence, Italy	179 (+75)														179
Naples, Italy	250 (+146)														250
Vienna, Austria	60 (-44)				80	60		140			25				365
Brussels, Belgium		10 (-86)	10 (-26)			80		10			5	10	30		155
Athens, Greece	131 (+27)						20		77	26			45		299
Helsinki, Finland	416 (+112)		84 (+48)										93		593
Coimbre, Portugal	120 (+16)		90 (+66)												210
Milan, Italy§	7,5	41.5				4							7		60
Genoa, Italy§	30														30
Madrid, Spain‖	11		4										5		20
Dublin, Ireland§	8		15										6		29
Oulu, Finland‖	9.75	1.75	0.75	0.75	1.5	0.75						1.5		3.6	20.3
London, UK§															
Lund, Sweden§	30	1.5												3	34.5

*The number of class hours as recommended by the European University Association (9,10).
†The number of class hours in the current curriculum of the school.
‡The number in brackets indicates the number of class hours below (-) or above (+) the recommendation of the European University Association (9,10).
§Medical schools whose curriculum is expressed in national credits.
‖Medical schools whose curriculum is expressed in European Credit Transfer System (ECTS).

because these are the times of intensive development and adaptation of the curricula.

One of the limitations of the study was that we analyzed only medical schools whose curricula were available on the Internet, so not all medical school curricula from Europe were included. Another limitation was that we relied only upon the data available on the web pages of the schools. For example, in France medical students have mandatory clinical practice; since the number of clinical practice hours is not stated in their official curriculum, these data were not included in our study. The main limitation was that the document with a recommended standard for European medical schools has not yet become official. We obtained a copy of the document from Zagreb University Rector, Prof. B. Jeren, but we have been unable to find it published in any form. It is possible that the standard undergoes changes before its application in the EU countries.

Clustering courses in preclinical, clinical (clinical-internal medicine and clinical-surgical), and public health groups was made for easier comparison of the curricula, although strict and standardized grouping did not exist in reality.

At some schools, several courses were combined in one, such as Surgery and Internal Medicine in Madrid, and Anatomy and Histology in Split, Budapest, Genoa, Naples, and Athens. At other schools, some large courses were split into smaller ones, such as Internal Medicine at the University of Vienna split into Cardiology, Nephrology, and Gastroenterology.

Our data indicate that mutual accreditation and mobility is difficult to achieve in the current situation of great diversity in the curricula. One of the initiatives, which helped solving many difficulties concerning accreditation in European higher education, is the implementation ECTS (3,4). Implementing ECTS is supposed to help free mobility and international recognition of the time spent studying abroad (4,5,12,13). Some European schools already use some kid of a credit system, such as Genoa, Milan, Lund, Helsinki, Dublin, and Madrid. Only a few of them, such as Madrid and Helsinki, have adopted ECTS, whereas the others still use their own national credit systems.

The fact that only a few schools so far have managed to apply and completely use the ECTS idea, which was born 10 years ago, illustrates the complexity of the project. The reform is not going to be easy and will require great changes in some schools, such as resigning their own study programs and courses, and accepting new ones. Would it be possible to promote international comparability and mobility and preserve cultural diversity of Universities and countries at the same time?

Every University has its own system, rules, and admission requirements, length of study programs, number of courses, course names and duration, type of examination, study fees, and type of the degree earned, which is all usually deeply rooted in the country's tradition. The tendency to uniform all study programs threatens the autonomy, which is granted to each University by Magna Charta Universitatum (14).

In the view of European actual political and economic movements, which have resulted in common currency and keeping borders only in a symbolic sense, establishing some common denominators and some uniformity in higher education also seems inevitable.

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