
Master in Human Medicine in Ticino

Final report

Working Group
“Scenarios for structuring the clinical education in medicine in Ticino”
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Abbreviations

BA	Bachelor
CCT	Cardiocentro Ticino
cp.	compare
EOC	Ente ospedaliero cantonale
FMH	Swiss Medical Association
FOPH	Federal Office of Public Health
FSO	Federal Statistical Office
HM	Human Medicine
IA	Intercantonal agreement
IRB	Institute for Research in Biomedicine
MA	Master
MAMed	Master in Human Medicine
MD	Medical Doctor
MEBEKO	Commission of medical professions
NC	Numerus clausus
OAQ	Swiss Center of Accreditation and Quality Assurance in Higher Education
RCSU	Rectors' Conference of the Swiss Universities
SER	State Secretariat for Education and Research
Sem.	Semester
SIWF	Swiss Institute for Continuing Medical Education
SNSF	Swiss National Science Foundation
SUC	Swiss University Conference
Unibas	University of Basel
UniBE	University of Bern
UniFR	University of Fribourg
UNIGE	University of Geneva
UniL	University of Lausanne
Unine	University of Neuchâtel
USI	Università della Svizzera italiana
UZH	University of Zurich
w.	week

Executive Summary

The limited number of study places available in Switzerland, the lack of physicians

In 1978, the Swiss universities trained nearly 1'200 physicians, of which less than 20% were women. In 2006, 600 students received their diploma in human medicine, of which 60% were women. In 2009, over 2'000 young physicians started to actively work as physicians, of which only about 700 were educated at Swiss universities; that is one out of three.

In 2010, nearly 4'000 candidates applied for one of the 1'084 available study places. The cantons and the Confederation invest over one billion CHF per year for the medical faculties. In a nutshell, this is the situation in Switzerland.

The potential of medical education and research for Ticino

Ticino has at its disposal a pool of clinical resources and of resources for clinical and biomedical research and teaching, that can be better exploited.

In Ticino, there are currently 37 physicians holding a professor title or a title as PD (Privat-Dozent) working at the EOC or in private clinics. The research in Ticino can count on about 25 mio. of funds from third parties per year. In 2009, the EOC has produced 211 scientific publications in peer reviewed journals. The existing public and private structures in Ticino enjoy 67 FMH certificates for the continuous education of medical specialists.

In the area of basic education the EOC hosts about 150 senior medical students every year for a total of about 350 months-person. Half of these senior medical students are studying at Swiss universities, whilst the other half are students studying abroad, mainly from Germany. The available number of training places would allow to host a higher number of senior medical students. Moreover, from 2012 onwards, the changes of the financing of private clinics should enable to extend the training and hosting possibilities.

In Ticino there are some centers of excellence, that distinguish themselves by the quality of clinical assistance or by their research and education activity (IOSI, CCT, NEUROCENTRO, IRB).

These skills and expertises are the fruit of the hard work of physicians' and research pioneers' and could not be further developed without a radical change such as the integration into a university-level education. The IRB is already affiliated to USI, but this process of consolidation of the network must be continued: the potential currently present in Ticino is certainly interesting and can be better exploited with the creation of a Master Medical School.

Students

In the academi year 2008/2009, 201 students from Ticino where studying human medicine in Switzerland. For the year 2010/2011, 141 Ticinese candidats have applied for a study place, but less than 30% thereof will be assigned one. The first conclusion is thus the following: because of the limited number of students from Ticino and in order to avoid academic isolation, it would not make sense to develop such a master medical training for ticinese students only.

Not a faculty, but a MasterSchool

Even before starting with this study it was clear that the option of creating an entire medical faculty would make little sense, because there is not a close Faculty of Natural Science to which the education

in natural sciences could be delegated.

On the other hand, we were surprised by the positive results when trying to match the current teaching potential in Ticino with the training structures and functions of the other Swiss medical faculties. In fact, our analysis showed that there are indeed many of the prerequisites to allow the set up of a Master medical training (i.e. the training years 4, 5 and 6), in close collaboration with one or more Swiss medical faculties.

The economical feasibility

From the financial point of view, even considering solely the costs for teaching and imagining the funding the research almost entirely from third parties, the project is challenging, but probably bearable for the cantonal finances.

Basing on the intercantonal agreements, the Cantone Ticino already pays CHF 5.3 mio. for all ticinese students doing their Master in Medicine outside Ticino. On the other hands, its own current medical teaching activity as well as the places offered for senior medical students are subsidised, neither by the other cantonal universities, nor by the Confederation.

An extrapolation based on statistical data from the FSO shows that the teaching costs for about 70 Master students would amount to about CHF 18 mio. per year and would require a doubling in competitive research (from 5 to 10 mio. CHF). The additional costs for the Cantone, according the current conditions of the Contract of Services – would thus amount to CHF 4 mio. for the teaching activity and 2 mio. CHF for the research activity.

Advantages for the Canton

A Master medical school at USI would not only contribute to the solution of a serious national problem, but it would also have important positive effects on the quality of health care, on the development of research and its integration into an academic context, and finally also it would have important repercussions for the industrial and economic structure of Ticino. The Master medical school would also elevate the prestige, visibility and attractivity of USI.

The creation of the Master medical school would also cause an opening of the ticinese research and teaching community to subsidies from the Confederation, from other cantons and from research funds. All this would contribute to improving the positive economic impact of the university activity as documented in the study “Bilancio economico e sociale USI SUPSI 2009”. Furthermore, the establishment of a well structured Master medical school could also encourage contributions from private foundations.

Next steps

This report will be presented to the State Council, who together with USI will have to evaluate if a study group needs to be formed to develop a further detailed project. If the second phase of study produces a convincing result, a message to the Cantonal Parliament, would have to be prepared.

At the same time, the report will be presented to the federal bodies (SER, CRUS, CUS) for the decisions of their competence (particularly, related to the policy concerning the numerus clausus) as well as to the Swiss universities with whom conventions that are essential for the realisation of this project shall be negotiated.

1 Study Group

1.1 Summary of the mandate from the "State Council" of canton Ticino

The mandate includes the following tasks to be consolidated in a report, possibly with recommendations and indications on the competitiveness and on the sustainability of the chosen models (see appendix A):

- Verify the conditions for an academic structure of the clinical education in human medicine and of the relevant research.
- Provide a complete list of the existing strengths and of the resources that must be attained through cantonal and cross-border collaborations.
- Examine the types of curricula that could be organised in the identified areas as potentially practicable.
- Indicate possibilities and conditions for student recruitment and the long term sustainability of the proposed training model.
- Prepare a time frame for the project, including the expected implementation phase, a description of the obstacles that should be overcome and a general analysis of the financial conditions linked to the possible concrete realisation.

1.2 Study Group

The Study Group consists of the following members:

- Prof. Dr. Piero Martinoli, President of USI, President of the Study Group
- Dr. Carlo Maggini, Director of the EOC
- Prof. Dr. Sandro Rusconi, Director of the Governmental Division of Culture and University affairs
- Prof. Dr. Suzanne Suter, President of the Swiss Science and Technology Council
- Prof. Dr. Patrick Francioli, Dean of the Faculty of Biology and Medicine at University of Lausanne
- Prof. Dr. Arnaud Perrier, Head of Internal Medicine at HUG and Professor in Medicine at UNIGE
- Prof. Dr. Bernard Vermeulen, Medical Director of HFR Fribourg

1.3 Project evolution

Project evolution		2009										2010										2011
Date	Activity	Mai	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Mai	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
12.05.2009	Received mandate from Canton Ticino	12.5																				
18.08.2009	Meeting with Study Group				18.8																	
08.12.2009	Meeting with Study Group								8.12													
30.04.2010	Meeting with Study Group												30.4									
24.06.2010	Meeting with University of Zurich														24.6							
19.08.2010	Meeting with University of Basel																19.8					
13.09.2010	Meeting with University of Bern																					
03.12.2010	Meeting of the Consiglio dell'USI																					3.12
15.12.2010	Event with physicians and hospital directors																					15.12
17.01.2011	Meeting with Study Group																					17.1
January 2011	Handing in final report to the "Consiglio di Stato"																					

Table 1: Evolution of the project

Date	Meeting with	Location	Participants
18 Aug. 2009	Study Group	Università della Svizzera italiana. Lugano	The members of the Study Group
8 Dec. 2009	Study Group	Federal Office of Public Health, Bern	The members of the Study Group <i>Additionally:</i> - Mauro Martinoni, USI - Albino Zraggen, USI - Luca Crivelli, USI - Aris Mozzini, DECS - Thomas Zeltner, FOPH - Stefan Spycher, FOPH - Catherine Gasser, SER
30 Apr. 2010	Study Group	Università della Svizzera italiana	The members of the Study Group <i>Additionally:</i> - Mauro Martinoni, USI - Albino Zraggen, USI - Luca Crivelli, USI - Monica Link, USI - Aris Mozzini, DECS
24 Jul. 2010	University of Zurich	Università della Svizzera italiana	- Heini Murer, Prorector of Medicine & Natural Science, UZH - Klaus Grätz, Dean of Medicine, UZH - Erich Russi, Dean of education, UZH - Gregor Zünd, Director of clinical research, USZ - Piero Martinoli, USI - Carlo Maggini, EOC - Mauro Martinoni, USI - Luca Crivelli, USI - Monica Link, USI <i>By phone:</i> Rita Ziegler, Director of Hospital, USZ
19 Aug. 2010	University of Basel	University of Basel, Basel	- Peter Meier-Abt, Vice Rector, Unibas - Albert Urwyler, Dean of Medicine, Unibas - Stephan Marsch, Vice Dean of education, Unibas - Werner Kübler, Director of University Hospital, Basel - Hedwig-J. Kaiser, Vice Rector of education, Unibas - Piero Martinoli, USI - Carlo Maggini, EOC - Mauro Martinoni, USI - Monica Link, USI - Sandro Rusconi, DECS
13 Sept. 2010	University of Bern	University of Bern, Bern	- Martin G. Täuber, Vice Rector, UniBE - Peter Eggli, Dean of Medicine, UniBE - Matthias Gugger, UniBE - Piero Martinoli, USI - Carlo Maggini, EOC - Mauro Martinoni, USI - Monica Link, USI - Sandro Rusconi, DECS
3 Dec. 2010	Consiglio della Università della Svizzera italiana	Università della Svizzera italiana, Lugano	The members of the "Consiglio dell' Università della Svizzera italiana"
15 Dec. 2010	Informative evening event	Università della Svizzera italiana, Lugano	Physicians with academic activity working in Ticino Directors of clinics in Ticino Physicians with institutional functions in Ticino Some physicians with medical practice in Ticino Directors of the EOC hospitals
17 Jan. 2011	Study Group	Università della Svizzera italiana, Lugano	The members of the Study Group

Table 2: Chronology of meetings

The Study Group was composed of representatives from the medical faculties in Geneva, Lausanne and Fribourg. Afterwards, the universities of Zurich (UZH), Basel (Unibas) and Bern (UniBE) also expressed their interest in the project, which was then discussed bilaterally during separate meetings.

2 General overview

2.1 Trends of the number of medical personnel

The main trends in the development of medical personnel are the following:

- Feminisation entails an increasing number of part-time professionals, requiring the education of more physicians in order to fill the same number of full-time positions with part-time professionals (cp. BASS and appendix B).
- The age pyramid shows that 45% of all actively working physicians are over 50 years old: meaning that within the next 15-20 years many of them will retire (cp. FMH 2009 and appendix C).
- The Swiss universities educate only one third of the physicians needed.
- The aging population is increasing the demand for medical services (cp. Obsan, 2009).

These trends clearly show that in the future, Switzerland will need more medical personnel, but is currently unable to educate them.

2.1.1 Lack of physicians educated at Swiss universities

For the first time in 2009, the number of actively working physicians has surpassed 30'000. There were 30'166 physicians registered in Switzerland, of which 10'673 were females and 19'493 males (see figure 1). Of these 30'166 physicians, 7'123 hold a foreign diploma. The total inflow of new physicians in the same year amounted to 2'051, of which only 728 were educated at Swiss universities, whilst the remaining 1'323 physicians immigrated from abroad (cp. FMH statistics 2009 and UST and appendix D). This indicates that the Swiss medical faculties educate only one third of the necessary number of physicians. According to the age pyramid, this situation will worsen in the coming years, because about 13'500 physicians will retire within the next 10-15 years. In order to balance this outflow, the universities have to educate more physicians. According to the data from 2010, the inflow should be approximately 2'000 physicians: Switzerland cannot continue depending on the foreign physicians attracted by good working conditions.

The following flow chart illustrates the current situation, with the in- and outflow of physicians in 2009:

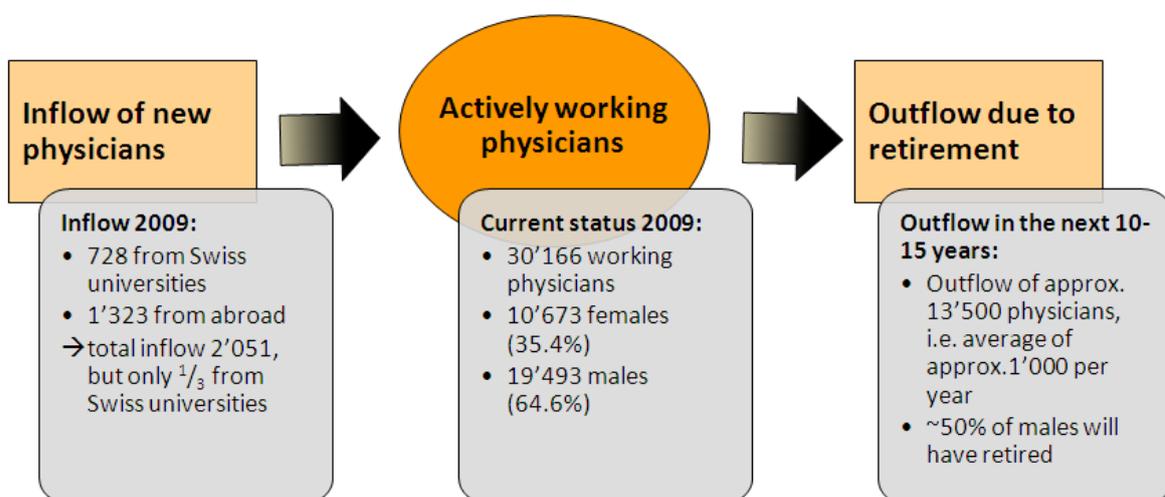


Figure 1: In- and outflow of actively working physicians

The main problem is the limited capacity in education: our university system restrains a great number of young Swiss people from studying human medicine. In fact, the aptitude test defines a ranking, which is used as *numerus clausus* (NC). It does not represent a qualification criterion. In 2010, only 763 of 2'651 candidates were granted a study place in human medicine. This does not mean that the candidate who ranked 764th and who therefore will not be able to start his studies, did not possess the innate abilities to study human medicine. It simply means that there were not enough study places available. In particular, this situation reveals that there are well-qualified candidates who are restrained from studying human medicine, while medical personnel needs to be recruited from abroad.

As long as the Swiss working conditions keep attracting professionals from countries near-by Switzerland, the fact that Switzerland educates an insufficient number of physicians, thus depending on physicians educated abroad, can be considered a minor problem. However, one must not neglect the fact that education is closely tied to research, such that depending on foreign countries impairs the Swiss scientific network, with all the respective consequences on industrial and biotechnical impacts.

Also, from an ethical point of view, Switzerland cannot ban its young generation from studying medicine, and instead take some of the best physicians from foreign countries, which have invested in their education. This may be an emergency solution for the health system, but for the education system it is a serious impoverishment, also reducing the research potential and the known positive impacts.

The same process can be seen in other scientific and technical areas, but in human medicine it is not the qualified and interested candidates who are missing (recall that the aptitude test defines a ranking which does not indicate that an excluded individual lacks the abilities to successfully study human medicine). Furthermore, importing computer specialists from abroad has a different impact than recruiting general practitioners from culturally diverse countries. That is, if the physician-patient relationship and the knowledge of the dynamics are still considered aspects of the cure.

2.1.2 Willingness to increase the number of study places in Switzerland

This politically important situation was bound to cause reactions. Adjacent to the political initiatives, the universities have decided to slightly increase their intake capacities from 2010/11 onwards (in the range of 20%, respectively ca. 100 more places in Switzerland), which is clearly not enough to cover the need for new physicians.

Since the Swiss government is worried about the lack of study places in medicine, it has asked the Swiss medical faculties to increase their intake capacity: this clearly is an enormous task, because the issue is not to increase the capacity by merely few dozens of places, but rather to fill the gap from the ca. 700 newly-certified physicians up to the required 2'000 new physicians per year (see figure 1).

2.1.3 Political request to USI about collaborating

First, Federal Councillor Couchepin followed by Federal Councillor Burkhalter from the Federal Department of Home Affairs have both asked USI to contribute to the solution of this national emergency.

The State council of canton Ticino and USI have accepted this interesting invitation, being fully aware of their limits, but convinced that this is an opportunity to develop both education and research at an academic level in Ticino. Even if this appears like a rather small contribution towards the solution of a national problem, it is an important impulse on the way to improve the quality of health care.

2.2 Statistical data

The following statistical data reflect the current situation of demand and supply, related to the education in human medicine.

2.2.1 Students wanting to study human medicine

In 2010, 3'824 people have registered to study human medicine, whilst there were only 1'084 study places available (653 places at universities with NC, 431 places at universities without NC). It has been a political decision to limit the number of study places, justified by the high costs of the education and by the limited resources available for the clinical education in university hospitals, but also by the threat that upon training an excessive number of physicians the health care costs would increase in a non controllable manner.

2.2.2 Selection before starting the study

In 1998, the Universities of Bern (UniBE), Basel (Unibas), Zurich (UZH) and Fribourg (UniFR) introduced the *numerus clausus* by subjecting all candidates to an aptitude test, which will put them in an order of ranking. In this manner a controlled number of top candidates will be assigned a study place at one of the available universities (possibility taking care of their preference).

For 2010/11, 2'651 candidates have applied for a study place at universities with NC. Of these, 2'040 have completed the aptitude test with a valid result and the 763 candidates with the highest scores have been admitted to the study. As a matter of fact, only 653 study places were available, but experience shows that not all the admitted candidates will actually start their study, therefore a higher number of candidates were admitted (cp. EMS report 2010).

2.2.3 Selection during the education

The Universities of Geneva, Lausanne and Neuchâtel have not introduced the *numerus clausus*. All students with the necessary qualifications can register for the first semester. In 2010, 1'173 students registered at those three universities (UNIGE, UniL, Unine), despite there being only 431 study places available.

The selection takes place gradually like in other fields, but obviously with a higher failure rate than at the universities with NC: particularly Geneva considers the first year as a contest year with a success-rate of about 35%, but with much higher success rates for the following years.

3 Medical education at the Swiss faculties BA, MA, MD and PhD

3.1 Education models of the five faculties

The curricula of the five medical faculties are based on the same educational objectives, but they are different in structure and sequence. The first two years of the BA education are still quite similar at all five faculties, but from the third year on, the models start to vary quite remarkably. As a matter of fact, the didactic sequence can vary according to the objectives of the “Swiss Catalogue of Learning Objectives for Undergraduate Medical Training”. The catalogue defines the competences, which the student has to possess by the end of the study. These competences are tested during the state examination, which will be newly organised starting in 2011 (cp. www.scio.smifk.ch and see 3.3).

3.2 Sinoptical table of the curricula at the five medical faculties in Switzerland

3.2.1 Bachelor education

The organisation of the Bachelor is quite similar at all five medical faculties (plus the Faculty of Science of University of Fribourg), with some differences during the third year.

Bachelor	Semester	Month	Zurich	Bern	Basel	Geneva	Lausanne	Fribourg
1st year	1. sem.	Sept.	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 15 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education
		Oct.						
		Nov.						
		Dec.						
	2. sem.	Jan.	holidays	holidays	holidays	holidays	holidays	holidays
		Feb.	Feb.-May.: 15 w.: courses & clinical education	15 w.: courses & clinical education	Feb.-May.: 15 w.: courses & clinical education	Feb.-May.: 17 w.: courses & clinical education	Feb.-May.: 14 w.: courses & clinical education	Feb.-May.: 14 w.: courses & clinical education
		Mar.						
		Apr.						
May								
Jun.	holidays	holidays	holidays	holidays	holidays	holidays		
Jul.	holidays	holidays	holidays	holidays	holidays	holidays		
Aug.	holidays	holidays	holidays	holidays	holidays	holidays		
2nd year	3. sem.	Sept.	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Feb.: 18 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education
		Oct.						
		Nov.						
		Dec.						
	4. sem.	Jan.	holidays	holidays	holidays	holidays	holidays	holidays
		Feb.	Feb.-May.: 10 w.: courses & clinical formation	16 sett.: corsi & formazione clinica	Feb.-May.: 16 w.: courses & clinical education	Feb.-May.: 16 w.: courses & clinical education	Feb.-May.: 14 w.: courses & clinical education	Feb.-May.: 14 w.: courses & clinical education
		Mar.						
		Apr.						
May								
Jun.	holidays	holidays	holidays	holidays	holidays	holidays		
Jul.	holidays	holidays	holidays	holidays	holidays	holidays		
Aug.	holidays	holidays	holidays	holidays	holidays	holidays		
3rd year	5. sem.	Sept.	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 15 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 16 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education	Sept.-Dec.: 14 w.: courses & clinical education
		Oct.						
		Nov.						
		Dec.						
	6. sem.	Jan.	holidays	holidays	holidays	holidays	holidays	holidays
		Feb.	Feb.-May.: 13 w.: courses & clinical education	17 w.: courses & clinical education	Feb.-May.: 13 w.: courses & clinical education	Feb.-Jun.: 20 w.: courses & clinical education	Feb.-May.: 14 w.: courses & clinical education	Feb.-May.: 14 w.: courses & clinical education
		Mar.						
		Apr.						
May								
Jun.	holidays	holidays	holidays	holidays	holidays	holidays		
Jul.	holidays	holidays	holidays	holidays	holidays	holidays		
Aug.	holidays	holidays	holidays	holidays	holidays	holidays		
Jul.: Bachelor study is finished		Jul.						
		Aug.						

Table 3: Sinoptical table of the curricula of the Bachelor in human medicine in Switzerland

3.2.2 Master education

This table shows a simplified model of the organisation of the Master education at the five faculties:

Master	Semester	Month	Zurich	Bern	Basel	Geneva	Lausanne
4th year	1. sem.	Sept.	Sept.-Dec.:	Sept.-Dec.:	Sept.-Dec.:	Sept.-Dec.:	Sept.-Dec.:
		Oct.	14 w.: courses & clinical education	14 w.: courses & clinical education	14 w.: courses & clinical education	15 w.: courses & clinical education	17 w.: courses & clinical education
		Nov.					
		Dec.					
	2. sem.	Jan.	holidays	holidays	holidays	holidays	holidays
		Feb.	Feb.-Jun.:	Feb.-Jul.:	Mar.-Jun.:	Feb.-Jun.:	Mar.-Jul.:
		Mar.	15 w.: courses & clinical education	24 w.: courses & clinical education	13 w.: courses & clinical education	16 w.: courses & clinical education	16 w.: courses & clinical education
		Apr.					
May				holidays			
Jun.							
Jul.	holidays			holidays	Jul.-Aug.: 8 w.: courses & clinical education	holidays	
Aug.							
5th year	3. sem.	Sept.	Sept.-Jul.:	Aug.-Sept.:	Sept.-Dec.:	Sept.-Nov.:	3 w.: Master thesis
		Oct.	practical year	8 w.: Master thesis	14 w.: courses & clinical education	12 w.: courses & clinical education	Oct.-Feb.:
		Nov.	10 months	holidays	holidays	holidays	17 w.: courses & clinical education
		Dec.		Dec.-Feb.: 14 w.: courses & clinical education	holidays	holidays	
	4. sem.	Jan.				Jan.-Apr.:	
		Feb.		Feb.-Mar.:	Mar.-Dec.:	12 w.: courses & clinical education	holidays
		Mar.		3 w.: preparation	practical year		
		Apr.		holidays	30 weeks	4 w.: Master thesis	May.-Apr.:
May		May.-Nov.:		holidays		practical year	
Jun.		practical year				10 months	
Jul.	holidays						
Aug.							
6th year	5. sem.	Sept.	Sept.-Dec.: 14 w.: courses & clinical education			Aug.-Jun.:	
		Oct.		holidays	holidays	practical year	
		Nov.				40 weeks	
	6. sem.	Dec.					
		Jan.	holidays		holidays		
		Feb.	Feb.-Apr.:	Feb.-Apr.:	Mar.-Apr.:		Mar.-Apr.:
Mar.	7 w.: repetition	14 w.: repetition	7 w.: Master thesis		7 w.: Master thesis		
Apr.			May.-Jun.:		May.-Jun.:		
May	May.-Jun.:	May.-Jun.:	7 w.: repetition		6 w.: repetition		
Jun.	7 w.: practice in groups	4 w.: preparation					
Lug.: finito il studio di master	Jul.	holidays	holidays	holidays	holidays	holidays	
Aug.	Aug.-Sept.:	Aug.-Sept.:	Aug.-Sept.:	Aug.-Sept.:	Aug.-Sept.:	Aug.-Sept.:	
Sept.	state examination	state examination	state examination	state examination	state examination	state examination	

Legend:

- courses & clinical education
- practical year
- repetition, preparation and Master thesis

Table 4: Sinoptical table of the curricula of the Master in human medicine in Switzerland

3.3 State examination (competence of the FOPH)

According to the federal law on medical professions at a university level (MedBG), the new state examination in human medicine will be carried out for the first time in August/September 2011. It is the faculties' responsibility to ensure that all exams during the BA and MA education meet the objectives defined by the Catalogue (see 3.1). The responsibility of the state examination, on the other hand, lies with the Confederation and the FOPH, together with the Commission of Medical Professions, MEBEKO (cp. www.bag.ch).

3.4 Medical doctor

According to the law, successfully passing the state examination allows the use of the doctor title. From an academic point of view, a clearer process for obtaining the title Medical Doctor (MD) is being discussed. It still leaves the possibility open to attain a PhD according to the modalities of a doctorate known from the scientific subjects, including an important part of research and an investment of at least three years.

3.5 Accreditation (competence of the SUC)

The Swiss University Conference alone is in charge of the accreditation of all university faculties except for the medical faculties. The accreditation of the medical education is a part of the responsibility of the independent accreditation authority (Swiss Accreditation Council), whilst the responsibility for the specialised education of physicians lies with the Federal Department of Internal Affairs. In the case of a new faculty, the accreditation is attributed at the end of a whole study cycle, which can cause uncertainties for the students.

The Swiss Center of Accreditation and Quality Assurance in higher Education (OAQ) is responsible for the valuation of the quality of teaching and of research. This valuation is based on an inspection of an expert commission (cp. www.cus.ch).

Nevertheless, a study title obtained at a recognised university has a value, even if the study cycle or the faculty has not yet been accredited. Particularly in medicine, none of the current procedures to accredit the Bologna system at the existing faculties have been concluded. Accreditation procedures for academic medical education have started in 2010 and have to be concluded by 31 August 2012 (cp. www.oaq.ch and Art. 63 MedBG).

Essential, though, is the competence of the FOPH, which allows MA students of a new faculty to attend the state examination.

3.6 Specialisation Swiss Medical Association (FMH): competences and financing

Many changes will take place in this sector, as well; in most European countries, the specialisation is subject to the universities, whilst in Switzerland the FMH assumes an important role. The FMH acts like a holding of the various associations of medical specialists. One of the central tasks of FMH, besides the allocation of the FMH specialisations, is the continuing education of physicians through the Swiss Institute for Continuing Medical Education (SIWF). The fee for a FMH title is CHF 4'000.-- (cp. www.FMH.ch, Gebührenordnung).

4 General financing in Switzerland

4.1 Collecting data from the faculties

Considering the organisational differences, it is extremely difficult to obtain comparable data about the costs and revenues of the medical education: the split between universities, faculties, research institutes and hospitals varies strongly, giving little transparency into the financial situation. The SUK has commissioned a study, but to date, it is unavailable: similar efforts have been made in the past without attaining satisfactory results.

4.2 Costs

The Federal Office of Statistics (FOS) has published comprehensive data, pointing out that this is a hasty generalisation, keeping in mind the difficulties in having common parameters.

Based on the study “*Kosten der universitären Hochschulen 2009*”, FOS, the total sum of over one billion CHF is split into the following units (average of all medical faculties in Switzerland):

- Basic education (Bachelor + Master) 17.9%
- Deepened education (p.e. dottorato) 5.4%
- Research and development 61.7%
- Continuing education (p.e. MAS) 5.2%
- Services 9.9%

This report analyses the costs for “Basic education” and for “Research and development” only.

4.2.1 Costs for the basic education

Table 5 illustrates an extrapolation of the data presented in the document “*Kosten der universitären Hochschulen 2009*”, FOS. The first column represents the total costs per university. The second column shows the costs for the basic education per university (17.9% of total costs). The third column displays the number of certified students in 2009. The fourth column presents the costs per student for the basic education and finally the last column contains the costs per student per year. It needs to be highlighted that this is simply an extrapolation to give an idea of the cost dimensions: any comparison between the different universities is speculative.

University	Total costs human medicine 2009	Costs for BA and MA (17.9% of total costs)	Number of certified students 2009	Costs per student for BA and MA, 6 years	Costs per student per year
Unibas	154'975'165	27'740'554	150	184'937	30'823
UniBE	234'114'352	42'906'469	146	287'031	47'838
UZH	319'616'127	57'211'287	216	264'867	44'145
UNIGE	132'569'526	23'729'945	104	228'173	38'029
UniL	204'636'140	36'629'869	112	327'052	54'509
Total	1'045'911'309	187'218'124	728		Mean 43'069

Table 5: Costs per student per year, per medical faculty in Switzerland (in CHF)

4.2.2 Costs for research and development

In the following table, the costs presented in the first two columns have been gathered from the document “Kosten der universitären Hochschulen 2009”¹⁾, whilst the last two columns list the contributions from third parties, taken from the document “Finanzen der universitären Hochschulen 2009”²⁾ (see appendix E).

University	Total costs human medicine 2009	Costs for research and development (61.7% of total) ¹⁾	Financing from SNSF ²⁾	Financing from third-party funds ²⁾
Unibas	154'975'165	95'619'677	13'163'496	33'536'765
UniBE	234'114'352	144'448'555	14'411'004	39'418'561
UZH	319'616'127	197'203'150	24'854'660	62'312'353
UNIGE	132'569'526	81'795'397	21'828'652	35'973'125
UniL	204'636'140	126'260'498	24'019'727	37'757'251
Total	1'045'911'309	648'327'278	98'277'539	208'998'054

Table 6: Costs for research and development and financing of third parties (in CHF)

Basic research is financed with competitive mandates, which represent a moderate part of the total costs. Keeping in mind the different funds, it remains difficult to explain the difference between the costs for research and development and the financing funds (FNRS and third party). This aspect will be elaborated in more detail during phase 2.

4.3 Financing

Federal act on the promotion of universities (Universitätsförderungsgesetz UFG)

In order to promote the quality of education and research, the Swiss Confederation collaborates with the cantons in the area of university politics. Among other things, the Confederation participates in university politics by remitting subsidies in the form of basic support and support dedicated to projects. The yearly total amount is split between the beneficiaries according to their teaching and research activities. The contributions paid for the teaching activities are mainly calculated per student. Therefore, the amounts will vary from year to year. For this project, the contributions should amount to approximately CHF 14'000.— per Master student (cp. Universitätsförderungsgesetz, UFG, Art. 1; 4; 15). The contributions from UFG favour research from the SNSF and the EU.

Intercantonal agreement about universities (IA)

The intercantonal agreement governs the admission to universities according to the principle of equal treatment and defines the amount that the student's canton of origin must pay to the university canton. The three years of Master in Human Medicine are in “Faculty Group III”, hence the contribution paid to the university canton for each student is CHF 48'600 per year, for a limited duration of 16 semesters (cfr. Intercantonal agreement about universities, Art. 1; 9; 12; 14).

The amount is the result of a political agreement between the cantons depending on various factors, including the academic migration. It cannot be used as reference data on the costs of a single year of study.

Mandates from the SNSF and the EU

SNSF and the EU projects represent the main source of financing of scientific projects. In the coming years, SNSF intends to increase the contribution granted for specific projects in the area of medical research (cp. www.snf.ch Statuten und Jahresbericht 2009).

Applied and clinical research and mandates

In the area of medicine clinical research, in particular the clinical research linked to the development of new pharmaceuticals, assumes a high importance and is developed in collaboration with pharmaceutical companies as well as with external agencies that participate strongly in the funding.

Apart from clinical research with patients, research on the different applied sciences related to medicine (mechanical prostheses, electrotechnics, domotics, new materials, etc.) should be established in collaboration with agencies and, particularly important, to develop new innovative agencies.

Another significant sector is represented by mandates from public companies or foundations on particular aspects: the economic kind (health costs), the communication kind (prevention campaigns, health education) or the sociological kind (ageing of the population, inflow of the urban structure on the consumption of medical treatment). USI and its institutions already possess experience and competences in these areas.

5 Analysis of the situation in Ticino

This chapter lists the existing know-how, skills and expertises and the structures in canton Ticino that could support the project of a Master in Human Medicine.

In order to proceed to a preliminary feasibility assessment of the project, the teaching skills existing in Ticino have been compared with two current models: the Master in Medicine at University of Lausanne and the Master in Medicine at University of Zurich.

5.1 Analysis of the potential students from Ticino

In 2008/2009, 201 students from Ticino were matriculated at the Swiss medical faculties: 91 students were in their 1st and 2nd year, whilst 110 students were in their clinical education, from 3rd to 6th year (cp. FSO and see appendix F).

In addition, there are students from Ticino matriculated at universities in Italy. An approximation of the number of students has been made by use of the rule of proportion: 71 of the 201 Ticinese studying in Switzerland receive a scholarship. Since there are 11 Ticinese studying medicine in Italy and receiving a scholarship, there shall be a total of approximately 31 Ticinese studying medicine in Italy. Therefore, there are about 230 students from Ticino all together studying human medicine in 2008/2009.

Human medicine	In Switzerland	In Italy	Total
Ticinese with scholarship	71	11	82
Total Ticinese studying human medicine in 2008	201	31 (estimate)	232

Table 7: Ticinese students studying in Switzerland and in Italy in 2008/2009

5.2 Competences and structures available at hospitals and clinics in Ticino

5.2.1 Physicians with academic teaching activity (habilitated physicians)

At the moment, there are 37 physicians with academic teaching activity (hereinafter called “habilitated physicians”) actively working at hospitals and clinics in Ticino, of which 19 hold a professor title and 18 hold a title of “Privat-Dozent” (PD). The table below shows how these habilitated physicians are divided into the different institutions:

Institution	Prof.	PD	Total
Ente ospedaliero cantonale	12	13	25
Cardiocentro	3	2	5
Other institutions in Ticino	1	1	2
Private institutions	3	2	5
Total	19	18	37

Table 8: Number of habilitated physicians actively working in Ticino

Most of the habilitated physicians are working in the areas of internal medicine and surgery.

Some of these habilitated physicians are already over 65 years old. Since the realisation of this project will take some time, it is not reasonable to take these most senior physicians into consideration. However, it is envisaged that they will be substituted by new postdoctoral candidates and by new habilitated physicians. Therefore, the current potential is about 40 lecturers.

Moreover, many physicians working in public and private institutions of the Canton can be taken into consideration for this project. Even if they are not habilitated physicians, they often possess extensive

clinical experience. Besides that, not all lecturers working at the Swiss medical faculties are habilitated physicians either. In those cases, they usually need the support from a chief physician (there are about 70 heads of department active at hospitals of the Canton).

In addition there are three biologists active in the clinics in Ticino, of whom one holds the professor title and the other two hold the title of PD.

5.2.2 Specialisation in medicine (FMH)

The public and private structures in Ticino currently offers 67 FMH certified modules for the education of medical specialists, of which 11 are in category A, 32 in category B, 23 in category C and one in category D. The centers of specialization are classified in four categories, according to their importance, infrastructure and quality of specialization (category A being the best qualification).

The certified units/modules are subdivided in the following way:

Institutions	Number of recognitions
Ente ospedaliero cantonale	* 54 certificates
Cardiocentro	4 certificates
Other institutions in Ticino	3 certificates
Private institutions	** 6 certificates
Total	67 certificates
<i>* of which eight are in category A / ** of which three are in category A</i>	

Table 9: Certified FMH continuous training modules in Ticino

The medical practices in the area are also able to participate in the specialisation, provided that they offer at least one training place (cp. 5.2.7).

5.2.3 Basic education in medicine

Within the basic education, the Ente ospedaliero cantonale hosts about 150 senior medical students every year for a total of about 350 months-person of clinical education (2.33 months per senior medical student). The majority of senior medical students are from Swiss universities (50%) and from Germany universities (40%). They are mainly hosted in the departments of internal medicine, surgery and paediatrics. On average, the private medical practices host additional 10 senior medical students every year.

Of the total training places offered in Ticino, only about 45% are occupied: this means that in case of a Master education in Ticino, students from other universities could still continue coming to do their clinical training in Ticino, as there are enough available training places (see appendix G).

5.2.4 Research

Table 10 lists the research activities of the institutions in Ticino during 2008, measured by mean of the peer review publications:

Institutions	Number of publications
Ente ospedaliero cantonale	* 133 publications
Cardiocentro	26 publications
Istituto di ricerca in biomedicina (IRB)	22 publications
Institutions in Ticino	20 publications
Other private institutions	10 publications
Total	211 publications
<i>* of which 62 publications are from the Istituto oncologico della Svizzera italiana (IOSI)</i>	

Table 10: Research activity in Ticino 2009, measured by number of publications

The coverage of the publications in 2009 is basically the same as the coverage in 2008, both in absolute terms (212 publications) and in terms of distribution among the institutions. In order to make a correct evaluation of the publications, the impact factor needs to be taken into consideration as well. Particularly, the IRB has a high impact factor. The results from ten years research performed at the IRB are published in about 300 articles with an average impact factor of 11.5.

The research activity can also be measured by the amount of third party funds, which are beneficial to the clinical research. The total volume of these funds in Ticino amounts to about 25 mio. (10 mio. IRB, 11 mio. EOC institutions, 3 mio. Cardiocentro, 1 mio. other clinics or research institutions).

5.2.5 Centers of excellence

In Ticino, there are some centers of excellence, that distinguish themselves either by the quality of clinical assistance or by their research and education activities. Based on these criteria, the following institutions are considered to be centers of excellence:

- Oncological Institute of the Italian part of Switzerland (IOSI) at EOC
- The Neurocentro of the Italian part of Switzerland at EOC
- The Cardiocentro Ticino

Also, the Institute for Research in Biomedicine (IRB), that is active in the area of immunological research, belongs to the category of centers of excellence. Furthermore, the IRB also dispenses a high level scientific training, both for students and graduates. The program includes seminars, lessons and summer courses. Since the beginning of the program, 40 doctoral theses have been successfully defended..

5.2.6 Composition of clinics

Currently, there are 20 institutions registered on the planning list of the cantonal hospitals. Together, they have 1'913 available beds, 1'432 of which in the area of acute care, 306 in psychiatry and 175 in rehabilitation.

For this study, the two largest institutions in Ticino have been taken into consideration: the "Ospedale regionale di Lugano" (ORL) with the affiliated "Cardiocentro" (CCT), and the "Ospedale regionale di Bellinzona" (ORB) with the associated "Istituto oncologico della Svizzera italiana" (IOSI). The following table lists the statistical data of these two conglomerates for the year 2009:

	ORL + CCT	ORB + IOSI	Total
Hospital beds	340	233	573
In house patients	26'000	10'000	36'000
Number of days of cure	110'000	72'000	182'000
Outbed patients	108'000	73'000	181'000
Number of employed physicians	250	170	420
Number of hosted senior medical students	50	40	90
Number of physicians with academic title	10	14	24
FMH certificates	18	18	36
Scientific publications	71	84	155

Table 11: Resources at ORL+CCT and at ORB+IOSI

Within these institutions, all the basic and specialised disciplines characterising hospitals with centralised assistance are present.

5.2.7 General practitioners

In Ticino there are about 1'000 general practitioners (independent physicians with a private practice).

The regulation of the FMH specialisations foresees that medical practices can be recognised as centers of specialised education. Currently, there are 16 medical practices in Ticino, which are recognised by FMH for their specialisation. The medical faculties often turn to general practitioners for the clinical education. For example, on the list "Praktizierende Ärzte, welche bereit sind, cand. med. im Wahlstudienjahr auszubilden" from the University of Zurich there are currently 3 medical practices in Ticino offering places for senior medical students (cp. www.med.uzh.ch, Institut für Hausarztmedizin).

5.2.8 Other centers for medical education

In Ticino there are two important specialist schools that would have the competences to support the teaching activity of the Master in Medicine. Those are:

- **The ESASO** (European School for Advanced Studies in Ophthalmology) ESASO aims to improve the clinical and surgical practice of specialists in ophthalmology in order to promote and enhance professional skills. Its objective is to provide ophthalmologists with postgraduate education and hands-on training from an internationally renowned faculty. Logistically, the school is situated nearby USI.
- **The ESO** (European School of Oncology): the school organises vast types of courses, including various discussion sessions for all professionals working in the area of oncology, no matter how experienced they are. The domicile in Ticino is situated nearby the IOSI and it coordinates the organisation of a Clinical Master class, an education activity organised in Switzerland by the international conference "Cancer on the internet," with all the activities in connection with the Cancerworld portal.

5.3 Comparison of resources engaged in the Master education

We present here below two purely illustrative simulations of the organisation of a Master, looking at the resources for teaching, the structures of the clinics and the existing research. The aim was to determine the size of the gap between available and necessary resources.

5.3.1 Comparison with the Master in medicine of the University of Lausanne

The Master in human medicine taught in Lausanne foresees 11 modules of teaching during the 4th and the 5th year of study, as well as clinical practice and preparation of the Master thesis (cp. Appendix H). In total, there are about 300 teachers associated with the programme, of which about 250 are habilitated physicians.

Keeping in mind the academic profiles and teaching skills currently present in Ticino, 6 of these 11 modules could be conducted with some support by external lecturers. 2 modules could only be conducted with strong reinforcement of lecturers and the remaining 3 modules could not be carried out (see appendix I).

5.3.2 Comparison with the Master in medicine of the University of Zurich

The Master taught in Zurich foresees 10 modules in the 4th year, as well as clinical education. The practical year is scheduled for the 5th year of study and the 6th year involves repetition, clinical training and preparation for the state examination (see appendix H). The modules of the 4th year engage about 220

lecturers, of which about 150 are habilitated physicians. For the winter semester of the 6th year, UZH employs about 100 lecturers, where 60 thereof are habilitated physicians. The following summer semester involves 140 lecturers, of which 110 are habilitated physicians.

Keeping in mind the academic profiles and teaching skills currently present in Ticino, 3 ZH-modules could be conducted, 4 ZH-modules could be conducted with strong reinforcement and 3 modules could not be carried out. Some courses of the clinical education during the 4th and 6th year could also be offered (see appendix J).

5.3.3 Preliminary conclusions

This first simulation reveals the size of the gap between the human resources (lecturers) engaged in the two masters at Lausanne and Zurich and the resources currently available in Ticino.

Having professors employed in the clinics does not automatically imply that these would show interest and availability to teach: the privilege to teach and to do research entails a significant increase of work. Therefore, it is inevitable that substitutes must be engaged during the time that these resources are absorbed with teaching and research.

It needs to be considered that from 1 January 2012 onward, private clinics will also be financed by the Canton. Therefore, their teaching and research activity is bound to increase.

Increasing the teaching staff is a crucial condition, but it will surely not be possible to find adequate resources for all the training modules. Therefore, the collaboration with one or more faculties becomes indispensable.

Some of the clinical education and the practical year, as well as the support and supervision of master theses, can be proposed in Ticino.

6 Hypothesis of a Master in Ticino / didactical model

6.1 Students

USI offers to increase the study places for the medical education in Switzerland; to enable this, the intervention needs to occur at the moment when students matriculate for the bachelor, that is when the ranking of the aptitude test is done.

USI proposes to admit 100 additional students to start the BA, students who would commit to USI as their preferred university for the Master study. This will be one of the crucial factors of the project: the other medical faculties will have to guarantee the education of 100 additional Bachelors in Human Medicine who foresee to continue their Master training at the USI. Already during the BA, the USI could offer to those students some training modules in themes regarding the medical education (communication doctor-patient, health economics, sociology, etc.).

For the three years of Bachelor, a 30% failure rate can be assumed, because of the requirements and the exams. Therefore, the Master would be structured for about 70 entering students per year. During the Master there still will be some failures, but in such a negligible amount that they have not been taken into consideration in our model.

Foreign students

USI has a long tradition in admitting foreign students. Therefore, the option to also accommodate foreign students who hold a degree of "Bachelor in Human Medicine" is not excluded at this point. One problem, however, would be that only very few countries apparently envisage to introduce the Bologna system (BA-MA) for the medical studies. Another problem with hosting foreign students would be that USI, above all, wants to increase the number of study places to accommodate Swiss students.

In this report, it is not foreseen to host foreign students (foreign students being students who live abroad and hold a foreign high school diploma): exceptions would only be possible in collaboration with federal authorities, considering the recommendations from the CUS, dated 12 October 2006 and in particular, verifying possibilities to access the state examination.

6.2 Language of teaching and in clinics

The language of instruction shall depend on the collaboration and the origin of professors (national languages and English). At the bed-side, some knowledge of the Italian language, as well as of the other Swiss national languages is necessary (the practical year, could be accomplished at institutions North of the Alps).

6.3 Simulation of a resource model

The curricula of the Swiss medical faculties are quite different in structure: in a simplified way, the five curricula can be merged into two models, with the practical year after two semesters of Master (model 1) or with the practical year after three semesters (model 2).

Model 1 refers to the curricula of UZH:

Semester / Activity	I	II	III	IV	V	VI	
Courses and clinical education	14 w.: courses and clinical education	15 w.: courses and clinical education			14 w.: courses and clinical education	14 w.: repetition and Master thesis	
Clinics and hospitals			20 w.: clinical practice	20 w.: clinical practice			
Courses in other subjects	law / ethics / communication / economics / psychology / sociology						
Individual research		Master thesis / methodology of research / individual coaching				Doctorate	
Exams	Exams	Exams				Master exams	State examination MD exams

Table 12: Didactic model 1

Model 2 refers, in a simplified way, to the curricula of the Master taught in Bern, Basel and Lausanne: Geneva has implemented an altered structure for their Master, different from model 1 and 2.

Semester / Activity	I	II	III	IV	V	VI	
Courses and clinical education	14 w.: courses and clinical education	15 w.: courses and clinical education	14 w.: courses and clinical education			14 w.: repetition and Master thesis	
Clinics and hospitals				20 w.: clinical practice	20 w.: clinical practice		
Courses in other subjects	law / ethics / communication / economics / psychology / sociology						
Individual research		Master thesis / research methodology / individual coaching				Doctorate	
Exams	Exams	Exams				Final exams of Master	State examination MD exams

Table 13: Didactic model 2

These simplified tables allows for analytical quantification of the necessary educational resources: the modules show differences in sequence, but are similar in the generale quantities.

6.4 Peculiarities of the education in Ticino – federal conditions

The medical education concludes with a state examination. On one hand, the catalogue of learning objectives imposes several obligations on the didactic offer (see 3.1). On the other hand, the variety of curricula within the Swiss medical faculties reveals room for some academic autonomy, giving each Master its own imprint. Competent bodies will have to evaluate the final contents, but some hypotheses related to the currently existing skills and specialties at USI can already be formulated.

One theme is certainly Communication sciences, be it for the time during treatment (i.e. the relation physician – patient) or for general problems (Communication as voice of politics in the general health care system). Another subject is related to economics and to research at all levels of the Economic Faculty. More and more, the ageing of the population is becoming a research objective because of both, the increase in demand for medical services and the challenge for the management of urban areas and

services. The know-how currently offered by the Faculty of Informatics should also not be neglected, because this field includes a significant potential for health applications. If we take into account the “Institute of Health Communication”, the “Master of Advanced Studies in Health and Socio-medical Economics and Management” and the “Institute of Computational Science”, we understand that USI offers important competences in these areas.

The final didactical model about “how” to transmit all these knowledges and competences assumes an increasing importance and will be elaborated in more detail together with the contracted university/ies during phase 2.

6.5 Timing of the project realisation

The entire project can be divided into four phases (see table 14):

- **Phase 1** includes the preparation of this report and concludes with its acceptance by the State Council of Ticino.
- **Phase 2** foresees deeper analysis of the project and the preparation of a second detailed report that would permit the elaboration of the policy message from the State Council (SC) of Ticino and its possible approval by the Cantonal parliament. Phase 2 should clarify the possibilities of stipulating conventions with the interested universities; the modification of the regulation of the NC by admitting an extra 100 BA students and the allocation of the study places for the MA.
- **Phase 3** includes the BA training of USI’s future students at the partner university/ies as well as the organisation of some teaching activity in Ticino in order to create a bond between those students and USI, the place where they will continue their MA studies. During this phase, Ticino will take action in the preparation of the clinical structures, in the elaboration of the organisational model, in the elaboration of the pedagogical model and the contents of classroom lectures, in the training of a “junior faculty”, in choosing tutors, in preparing the infrastructures (library, e-lab, etc.), and in kicking-off the research activity.
- **Phase 4** foresees the beginning of the Master courses in Ticino, whilst the training of the BA students would continue at the partner university/ies.

Phase	2010	2011	2012	2013	2014	2015	2016	2017	2018
Phase 1	Feasibility study								
Phase 2		<ul style="list-style-type: none"> • Decision FC • Decision NC • Partner university/ies 							
Phase 3				Education of BA students at partner universities Activities at USI: <ul style="list-style-type: none"> • Preparation of the clinical structures • Preparation of tutors • Bloc courses • Research impuls • Elaborate organisational model • Elaborate pedagogical model • Preparation of content for classroom lectures 					
Phase 4							Education of BA students at partner universities 70 MA students at USI 140 MA students at USI 210 MA students at USI		

Table 14: Phases of realisation

These forecasts are very conservative. It is possible to accelerate the different phases depending on the time needed for the decisions by the Cantonal parliament and the federal authorities.

7 Financial scenarios for a master medical training in Ticino

The scenario of this project is based on the possibility to clearly separate the financial responsibilities, with maximum transparency, as follows:

- The allowances for head physicians employed by the hospitals, having a mandate as professor with USI, would be handled internally between USI and EOC.
- The allowances for the teaching activity of titular lecturers and tutors in clinics, having a direct report with the EOC or the clinics, would be split among the institutions.
- The allowances for the teaching activity of researchers, employed by affiliated institutions, would be split among the institutions.

The affiliation model foreseen by the university law in Ticino allows an academic integration, keeping the management responsibilities separate: this should enable a more transparent management.

In order to guarantee updated and high quality teaching activity, the need for strong research activity is acute and remains a key objective. During the initial phase, much as it occurred at the other Faculties of USI, the main focus will be on the quality of the teaching activity, in collaboration with visiting professors who jointly retain courses at their home universities, who perform their research at their home universities. This explains the cautious cost forecasts: besides the teaching costs, which are extrapolations from federal statistics, the remuneration for 10 chairs of professorship has been included, allowing for in-house research activity. For the competitive research, double the current costs have been estimated (from 5-10 mio.). Based on the proposed management model (clear separation of management responsibilities), the clinical and the applied research is expected to be covered by third party funds in this initial phase, retaining the resources included in the chairs of professorship and being aware of the fact that financing by DRG (Diagnosis Related Groups) will not be possible for the clinics.

7.1 Phase 2

Mandate of further study to the USI, engaging a professional project manager and defining a project structure.

The costs of this phase are difficult to estimate, but they can be assumed as the equivalent of two full time positions at academic level and one secretary (indicative estimate of 500'000 CHF per year for 2011 and 2012).

7.2 Phase 3

To enforce the commitment of the students who have indicated USI as their preferred university for completing their Master (see 6.1), some activities (e.g. bloc weeks) can be foreseen at limited costs that do not have to be quantified at this stage.

The clinics in Ticino are accustomed to hosting students during their training, but they have not developed specific programmes. The medical and health personnel needs to be prepared in order to offer a high quality and highly structured training to students.

During this phase, in which there will not yet be any direct teaching activity in Ticino, the teaching staff - be it physicians who already have a habilitation or new junior professors - needs to be trained. Models similar to the ones applied by the SNSF (junior faculty) for assistant professors can serve as examples for this preparation.

A costs quantification of this phase is premature at this stage of analysis, but this will be one of the tasks during phase 2: the dimension can be estimated to amount to about 2 mio. per year.

7.3 Phase 4: implementation of the Master

7.3.1 Costs for the start-up

Besides the logistics (see chapter 8) additional costs related to the library need to be foreseen (access to specialised journals cause costs in the range of one million), as well as costs related to IT infrastructures for tele-teaching and for intervention simulations (indicatively 5 mio., with a 10 year amortisation).

7.3.2 Teaching and basic infrastructure for research

As mentioned, the Master would be organised to host 70 Swiss students per year (210 students at steady annual operation), of which one third would be Ticinese.

The model presented below gives an idea of the magnitude of the costs. The calculation is based on data from the FSO. As mentioned in chapter 4.2.1 the FSO has published a study with total costs of each medical faculty as well as an estimate of average costs per student, respectively of the costs for the various activities (teaching, research and development, continuing education, services).

The data from 2009 show average yearly costs for teaching of CHF 43'000, which equals to 17.9% of the total costs (see 4.2 and table 5). Obviously, this is a rough estimate, but it allows a first quantification of the costs.

Estimated yearly costs for the teaching activity per student	Costs in KCHF
Average costs per student per year of Human Medicine study (2009)	43 K
+ 15% inflation (2016)	7 K
+ 40% because the MA training is more expensive than the BA	20 K
Subtotal: estimated yearly costs per Master Human Medicine student at the USI	70 K

Table 15: Estimated costs for one student per year based on data from FSO

This estimation enables calculating the dimension of the steady annual operating expenditure of the Master: calculating 5 mio. of installation costs (library, e-lab, auditoriums, etc.) with a 10 year amortisation. One part of the activity will take place at the clinics, with expenses that will be reimbursed. Moreover, an additional fixed fee for each chair of professorship of CHF 200'000 per year, for 10 ordinary professors, is included. Emphasising that this is a rough estimate, it will be a task of phase 2 to prepare a better documented forecast.

Costs for 70 students per year → 210 students at steady annual operation	Costs in KCHF
Costs for infrastructure (amortisation: 10% of 5 mio.)	500 K
Direct expenses for teaching activity (70 KCHF * 210 students)	14'700 K
Expenses for activities in clinics	1'000 K
Additional outfit "chair of professorship" (10 chairs * 200 KCHF)	2'000 K
Total	18'200 K

Table 16: Costs for 210 students at steady annual operation

Based on the current data (IA, UFG contributions, fees, Contract of Services TI), it is possible to make an estimate about the magnitude of revenues.

Revenues for 70 students per year → 210 at steady annual operation	Revenues in KCHF
Intercantonal agreement (210 students* 48'600 CHF)	10'206 K
UFG (210 students * 14'000 CHF)	2'940 K
Immatriculation fees (210 students * 4'000 CHF)	840 K
Contract of Services TI (30% of IA + UFG + fees)	4'195 K
Total	18'181 K

Table 17: Revenues for 210 students at steady annual operation

Still to give an idea of the dimensions, appendix K simulates the progression of costs and revenues from the first year of Master with 70 students up to the steady annual operational situation with 210 students.

7.3.3 Basic research, clinical research and applied research

In the previous chapter, we have considered only the costs related to teaching and to infrastructure. The realisation of specific research projects will usually depend on receiving external fundings. The distinction between basic research, clinical research and applied research is not explicit: in this report we consider solely the administrative aspects that have financial implications.

Basic research, SNSF

Three main parties fund the basic research conducted at universities:

- The SNSF, which grants research mandates on a competitive basis, covering the biggest part of the costs assumed by the universities. EU projects are granted in the same way.
- The UFG, which contributes a yearly amount per student to cover the costs for infrastructure.
- The canton, for this project the Cantone Ticino, that – according to the current Contract of Services – pays an overhead of 40% on all competitive fundings.

In the future, this activity will augment, due to the increase of the number of professors as well as the increased collaboration options with other faculties at the USI (increase of 5 mio. with may impact on the Contract of Services TI).

Clinical research, applied research

At the federal level, clinical and applied research are considered activities that should be covered entirely by third parties (Companies, foundations, federal administrations) and hence, a direct supplementary contribution is not foreseen.

Currently, the clinical research at the EOC is funded entirely by third parties: in the future, an increase in clinical research is thus thinkable without a cost increase for the Canton.

7.3.4. Financial commitment of the various involved parties

Recalling the general considerations that were given at the beginning of chapter 7 regarding the split of the financial responsibilities between the various parties, the data from FOS (see 4.2.1) show that the overall costs are of CHF 1 billion for 728 diplomas (data from 2009). Extrapolating this for 70 diplomas and considering that the training offer in Ticino will be limited to 3 years, the financial engagement should amount to CHF 50 mio. per year (60% thereof dedicated to research).

The projections of the present report do not vary much from this dimension, but they foresee a different distribution of the financial responsibilities:

Activity	Engaged parties	Costs in CHF
Teaching and research infrastructure	UFG, IA, Contract of Services TI, fees	18 mio.
Basic research (currently 5 mio., with an increase of 5 mio.)	SNSF, UFG, Contract of Services TI, other competitive funds	10 mio.
Applied research (currently 20 mio., with an increase of 5 mio)	Companies, foundations, administrations	25 mio.
Total		53 mio.

Table 18: Distribution of the financial responsibilities

These figures may be studied in further details in phase 2.

7.4 Financial implication for the Cantone Ticino

7.4.1 Phase 2, deeper analysis

Estimate of 0.5 mio. – to be negotiated

7.4.2 Phase 3, preparation

Estimate of 2 mio. – to be negotiated

7.4.3 Phase 4: implementation of the Master

Recalling one more time how difficult it is to make plausible financial forecasts in this first phase analysis, the dimension should nevertheless be sufficient for taking a basic decision.

Teaching and infrastructure for research

The current Contract of Services foresees a contribution of 30% of all revenues per student (UFG, IA, fees):

- For 70 students, 30% is equivalent to about CHF 1.4 mio. (see appendix K). Hence, after the initial 3 years, the contribution from the Canton would amount to CHF 4.2 mio. for 210 students (see table 17).

The payments from the intercantal agreement would not be ex-novo expenses for the Cantone, since part of the payments that the Canton formerly transferred to other cantonal universities would be re-addressed to the USI.

Competitive research

According to the Contract of Services, the Cantone pays an overhead of 40% of the revenues derived from competitive research (SNSF, EU). The contribution allocated to the USI-affiliated IRB has been designated and budgeted in a message to the Cantonal Parliament (cp. Message to the Cantonal Parliament no. 6282, 13 October 2009). The additional research performed by other institutions, should increase the volume by about CHF 2 mio. This would imply an increase of cantonal payments due to the Contract of Services of about CHF 0.8 mio.

Clinical and applied research

No cantonal contribution from the Contract of Services is foreseen for clinical and applied research.

7.4.4 Additional charges

The overall additional charges for Cantone Ticino during the 3 years of Master education can therefore be estimated to amount to CHF 3 to 4 mio. The additional charges for the research activity during the same time can be estimated to amount to CHF 0.8 mio. (the contribution for the research at IRB is already included in the agreement of affiliation).

Additional charges for the EOC are not foreseen. The EOC is currently funded according to the parameters defined by TARMED that do not include contributions for education or for basic or clinical research from third parties. This should not change under DRG financing modus.

7.4.5 Financial flows

Looking at the cash flows from a national point of view and not from a cantonal one, the canton Ticino has to foresee the following cash flows, calculated for the model with 70 students per year (total 210), of which one third would be Ticinese.

(in CHF)	Current situation		Situation with MAMed at USI	
	Outflows	Inflows	Outflows	Inflows
Intercantonal agreement	110 Master students *48'600.— = 5.3 mio.		70 Ticinese outside Ticino * 48'600.— = 3.4 mio. 70 Ticinese at USI * 48'600 = 3.4 mio.	140 students from CH * 48'600.— =6.8 mio.
UFG	--	--	--	210 * 14'000.— =2.9 mio.
Research SNF	--	--	--	5 mio.
Contract of Services, teaching	--	--	4.2 mio. (see table 16)	
Contract of Services, research	--	--	2 mio.	--
Total	-5.3 mio.	0	-3.4 mio.	14.7 mio.
Balance of cash flows	-5.3 mio.		11.3 mio.	

Table 19: Financial flows

Currently, the Cantone is paying CHF 5.3 mio. per year to other universities without receiving any inflows. With the installation of the Master School the financial flows for Ticino will change: calculating with 70 Ticinese students outside Ticino and 70 Ticinese students at the MAMed-USI. According to the current the Contract of Services, the net outflow of CHF 5.3 mio. would be converted to a net inflow of CHF 11.3 mio.

This calculation could be further refined by taking in account the flows for of the scholarships, the re-search revenues and the costs for senior medical students currently covered by the EOC. All of these elements entail an increase to the inflows, making the balance sheet look even more positive.

8 Logistics

The mentioned logistical needs refer solely to the Master education activity. As for other projects, USI shall identify a definite logistical solution based on specific experience, without proceeding imagining as of now logistical solutions that may later turn out to be unsuitable.

8.1 Teaching: USI, Campus Lugano-Viganello, classroom lectures

Both didactic models foresee 4 semesters of on-site classroom education: two age-groups would be present at the same time, with classes of 50 to 70 students, requiring the occupation of two auditoriums throughout semester time during the morning.

8.2 Clinical education: EOC, clinical sites (Lugano and Bellinzona)

In the afternoons, the practical and theoretical training is scheduled to take place directly in the clinics, in presence of tutors and lecturers and in contact with patients. 5 to 7 rooms for 10/14 people are needed for the seminarial activity: in general, there are two courses per semester where the need for rooms may rise up to 10 to 14 at each site.

8.3 Basic research at the sites of the affiliated institutions

All the affiliated institutions have the necessary facilities for research.

9 Collaboration scenarios

For the explained reasons (limitations of academic and teaching competences present in Ticino, students coming from the various medical faculties, opening towards the FMH specialisation) it will be inevitable to collaborate with one or more Swiss medical faculties, at least in the beginning years.

Although state examination should verify a comprehensive catalogue of mandatory competences, this has not produced a unified didactic model. Each faculty organises the program of studies differently (see 3.2.2), rendering the collaboration modalities more difficult. A convention with one or more faculties should facilitate attainment of the following objectives:

- **Teaching quality:** parts of the teaching activity will be offered in Ticino, parts will be offered in Ticino with professors and resources from other faculties, and parts foresee the mobility of the students. The contracted faculty/ies are expected to assist the USI in assuring the high level of education.
- **Origin of students:** the idea is by no means to organise a School solely aimed at students from Ticino: the extra 100 BA study places shall be made available by the contracted Swiss medical faculty/ies and it is expected that they would properly inform and orient students about the possibility to complete the Master in Ticino.
- **Study title:** the title Master in Medicine guarantees an immediate recognition and access to the state examination.
- Allow physicians that have been newly trained in Ticino equal access to the FMH specialist education.
- Support USI with the procedures of accreditation and recognition (see 3.5)

In order to reach the objectives of the Convention, the following bodies are foreseen (*for analogy see the competences of the Council assembled at the moment of USI's foundation*):

- **USI Council:** approves requests from the Institute Council
- **Strategic Council:** Deans or presidents of the contracted university/ies
 - *Consulting body of the USI Council*
- **Council of the Institute of Medicine at USI**
 1. In the starting phase, the composition shall be defined by USI, the contracted faculties and by the EOC. Tasks:
 - *Preparation of the didactic program*
 - *Proposals of job advertisement*
 - *Proposals of teaching assignments*
 - *Procedure for appointing professors (composition of the committee: USI, contracted university, EOC)*
 2. During the phase of regular functioning:
 - *Directing body of the Institute of Medicine, like a faculty council: the contracted faculty/ies is/are represented by its/their professors.*
 - *The Council will be a body that coordinates the action between USI and the partner hospitals*

The Swiss faculties have shown a significant interest in this project and have expressed their availability to collaborate. At the moment, it is too early to take a decision. A concrete evaluation will only be possible during the second phase of the project, after a preliminary decision of the State Council.

10 Accompanying measures

The accompanying measures do not concern the key questions of the project, but they could help to build significant competences and relations.

10.1 Executive education

Executive educations are short-term offers for professionals with the goal of going in-depth on specific topics, often in an interdisciplinary way: so far, USI has successfully organised two courses: e-cardio and bio.business.

10.2 Post-graduate courses in medicine (see 5.2.8)

- **The ESASO** (European School for advanced studies in ophthalmology)
- **The ESO** (European School of oncology)

10.3 Education in complementary sectors

- Health Communication, Medical Humanities
- Simulations, Computational Science
- Economics: Health Economics and Management
- Urban structure, access to treatment, ageing of population
- E-learning (updating physicians according to the FMH agreement)

10.4 Scientific congresses and meetings

- Congress of Oncology (Congresso di oncologia)

10.5 Technological transfer

Biomedical companies, microelectronic companies, etc.

11 Final considerations

Based on this report, it is not possible to take final decisions; nevertheless, enough elements have been collected to indicate that a clinical training in Ticino, with the necessary collaboration, is an attainable objective.

The set up of a Master medical school at USI would allow, on one hand, a solution to a national problem, and on the other hand, it would strengthen the scientific component of the USI, giving important incentives to improve the clinical offer while increasing the overall research activity, with significant benefits also for the industrial and economic sector of the Cantone Ticino.

The financial flow analysis shows that the costs for the Cantone would be compensated with the expected benefits.

Mandate for phase 2

The State Council TI is kindly asked to approve the present report and, if considered convenient, to give a mandate to USI to continue with a phase 2 study.

Phase 2 should make it possible to gather the necessary elements to allow the State Council of Ticino, to elaborate a summon to the Cantonal parliament to allow the debate and the political decision.

Phase 2 will enable in particular to clarify the modification possibilities of the NC clauses, to negotiate a model convention with one or more Swiss medical faculties, to elaborate a teaching model and to prepare a solid financial foresight.

Acknowledgements

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For the Study Group, the President



Piero Martinoli

Lugano, 18 February 2011

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Appendix

Appendix A: Mandate from the State Council of canton Ticino

numero			Bellinzona
2237	Im	17	12 maggio 2009

Repubblica e Cantone
Ticino

Il Consiglio di Stato

viste:

- le recenti modifiche nel campo della formazione medica in Svizzera in conformità al modello risultante dalla Dichiarazione di Bologna;
- la necessità di garantire uno sviluppo dell'USI in generale nel settore delle scienze naturali;
- le opportunità offerte da una migliore strutturazione delle forze esistenti o potenziali del Cantone nel settore della formazione e la ricerca nel campo della medicina clinica e della biomedicina;
- le prevedibili ricadute positive di un consolidamento dei settori menzionati;

richiamati:

- il Messaggio n. 5978 del 10 ottobre 2007 concernente la Pianificazione 2008-2011 della politica universitaria: Università della Svizzera italiana (USI), Scuola universitaria professionale della Svizzera italiana (SUPSI), Alta scuola pedagogica (ASP) e Accordi intercantionali (AI), in particolare il Punto 2.2 e il relativo capitolo "Conclusioni";
- l'art. 1, cpv. 3 della Legge sull'USI, sulla SUPSI e sugli Istituti di ricerca, del 3 ottobre 1995;

sentito l'avviso della Presidenza dell'Università della Svizzera italiana e della Divisione della cultura e degli studi universitari;

su proposta del Dipartimento dell'educazione, della cultura e dello sport;

risolve:

1. È istituito il **Gruppo di studio "Scenari per una strutturazione della formazione clinica in medicina in Ticino"**, in seguito "Gruppo di studio".
2. Composizione
 - 2.1. Il Gruppo di studio è costituito da:
 - a) Tre membri designati dal DECS, nelle persone di:
 - **Piero Martinoli**, Presidente dell'USI, Presidente del Gruppo di studio;
 - **Carlo Maggini**, Direttore dell'EOC;
 - **Sandro Rusconi**, Direttore della Divisione della cultura e degli studi universitari.

-
- b) Quattro esperti designati dal Consiglio dell'USI nelle persone di:
- **Prof. Dr. Suzanne Suter** (Presidente del Consiglio svizzero della scienza e della tecnologia, CSST);
 - **Prof. Dr. Patrick Francioli** (Decano della Facoltà di biologia e medicina dell'Università di Losanna);
 - **Prof. Dr. Arnaud Perrier** (capo del servizio di medicina interna generale Hôpital universitaire Genevois e professore ordinario alla facoltà di medicina dell'UNIGE);
 - **Prof. Dr. Bernard Vermeulen** (Direttore medico del consorzio Hôpital fribourgeois).
- 2.2. Il Gruppo di studio ha la facoltà di attivare consulenze e perizie esterne.
- 2.3. Le funzioni di segretariato sono assunte dal coordinatore dell'Area degli studi universitari.
3. I compiti del Gruppo di studio sono così definiti:
- 3.1. Verificare se e quali condizioni esistono per una strutturazione accademica sul territorio cantonale della formazione clinica in medicina e della ricerca affine.
 - 3.2. Fornire un quadro completo delle forze esistenti e delle risorse che dovrebbero, rispettivamente potrebbero essere attinte da collaborazioni trans-cantonali o trans-frontaliere, procedendo alle necessarie audizioni preliminari delle parti interessate.
 - 3.3. Esaminare quali tipi di percorso formativo potrebbero venire strutturati negli ambiti identificati come potenzialmente attuabili.
 - 3.4. Dare indicazioni sulle effettive possibilità di reclutamento degli studenti e di sostenibilità dell'offerta formativa sul lungo termine, tenendo conto delle offerte concorrenziali in altre sedi ed identificando le eventuali nicchie di specializzazione ancora aperte.
 - 3.5. Preparare una tempistica di progetto comprensiva delle fasi di implementazione prevedibili, una descrizione degli ostacoli da superare ed un'analisi generale sulle condizioni finanziarie legate all'eventuale concretizzazione.
 - 3.6. Riassumere i punti 3.1.-3.5. in un rapporto che includa le eventuali raccomandazioni e fornisca indicazioni sulla competitività e la sostenibilità potenziale dei modelli prescelti.
4. Il termine di scadenza per il rapporto conclusivo è fissato al 30 settembre 2010.
5. I membri del Gruppo sono indennizzati secondo il Regolamento concernente le indennità ai dipendenti dello Stato, del 5 febbraio 1997. I costi sono attribuiti al conto n. 318.001 CRB 655 "Onorari e spese per consulenze, incarichi e perizie". Spese supplementari per perizie esterne possono venire suddivise fra Cantone e USI.

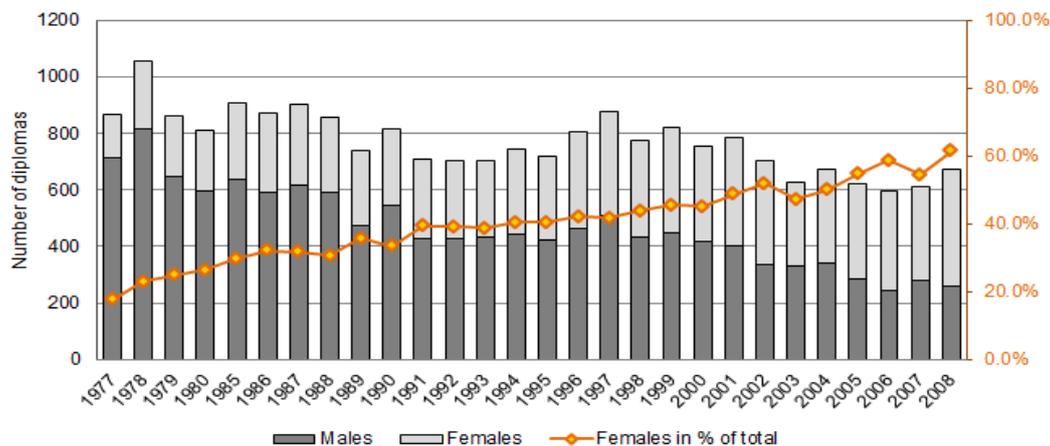
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6. Intimazione a: - Presidenza dell'USI per sé e per i membri di sua designazione (5)
- Direzione del DECS per sé e per i membri di sua designazione (4)
7. Copia a: Divisione della cultura e degli studi universitari, per sé e per l'Area degli studi universitari (2); Sezione amministrativa del DECS; Sezione delle finanze; Controllo cantonale delle finanze; Divisione delle contribuzioni; Sezione delle risorse umane; Ufficio stipendi.

PER IL CONSIGLIO DI STATO

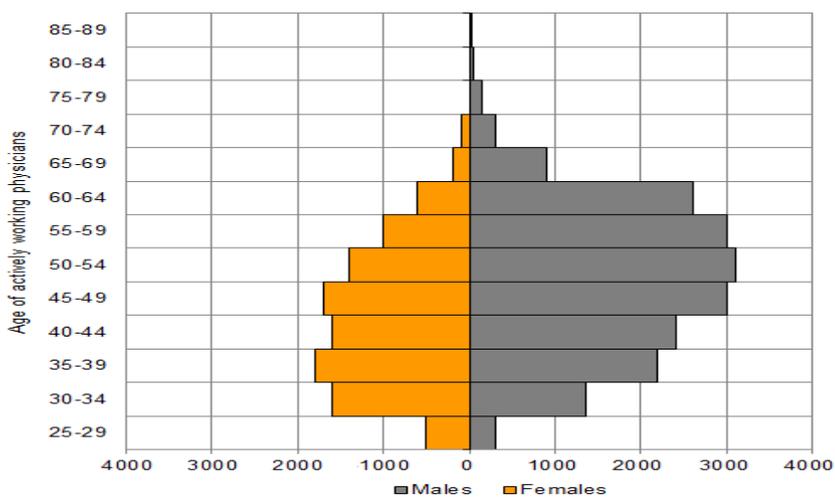
S. Gendotti
Presidente:
G. Gendotti

Il Cancelliere:
G. Gianella
G. Gianella

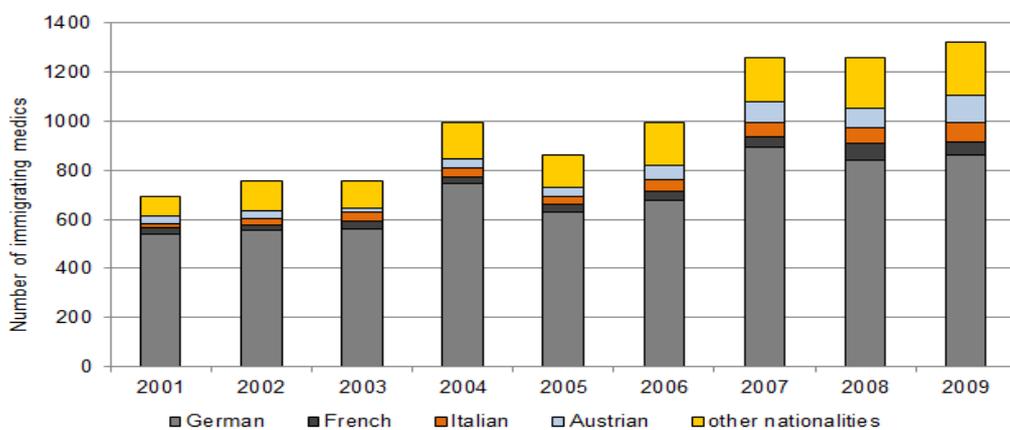
Appendix B: Diplomas in human medicine, 1977-2008 (years 1981-81 missing)



Appendix C: Age pyramid of the actively working physicians in Switzerland



Appendix D: Immigrating physicians per country of origin, 2001-2009



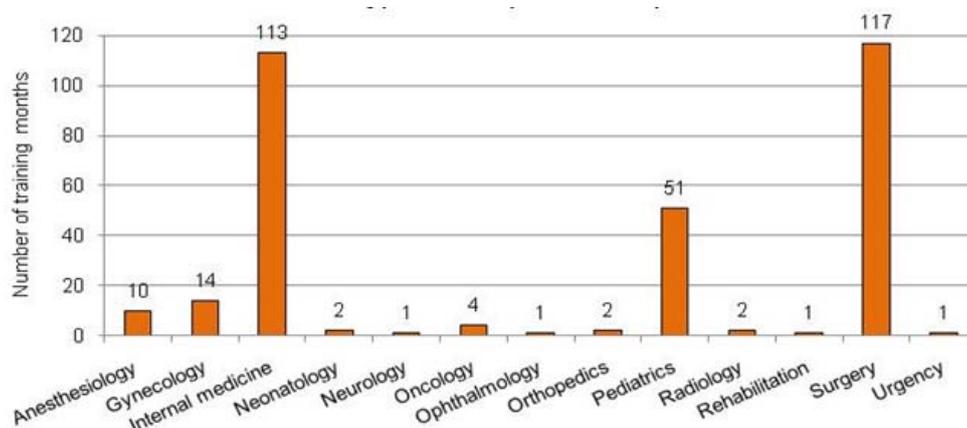
Appendix E: Expenses in human medicine 2009, per university

Persaufwand		Basel	Bern	Zurich	Genf	Lausanne	CH Total
Hochschulrechnung		18'759'148	67'806'391	90'752'782	72'616'453	23'880'870	273'815'645
Drittmittel	-CH Nationalfonds	9'961'698	9'990'905	19'107'625	12'915'100	15'483'851	67'459'179
	-übrige Drittmittel	22'257'804	24'007'752	44'123'579	24'478'878	26'253'481	141'121'493
alle Finanzquellen		50'978'650	101'805'048	153'983'986	110'010'430	65'618'202	482'396'317
Sachaufwand		Basel	Bern	Zurich	Genf	Lausanne	CH Total
Hochschulrechnung		89'515'755	112'478'395	141'696'331	2'151'297	118'978'292	464'820'071
Drittmittel	-CH Nationalfonds	3'201'798	4'420'099	5'747'036	8'913'551	8'535'876	30'818'360
	-übrige Drittmittel	11'278'961	15'410'809	18'188'774	11'494'247	11'503'770	67'876'561
alle Finanzquellen		103'996'515	132'309'304	165'632'141	22'559'095	139'017'938	563'514'993
Total Aufwand		Basel	Bern	Zurich	Genf	Lausanne	CH Total
Hochschulrechnung		108'274'903	180'284'787	232'449'114	74'767'749	142'859'163	738'635'716
Drittmittel	-CH Nationalfonds	13'163'496	14'411'004	24'854'660	21'828'652	24'019'727	98'277'539
	-übrige Drittmittel	33'536'765	39'418'561	62'312'353	35'973'125	37'757'251	208'998'054
alle Finanzquellen		154'975'165	234'114'352	319'616'127	132'569'526	204'636'140	1'045'911'309

Appendix F: Human medicine students from Ticino (data from 31.12.2009)



Appendix G: EOC training places occupied in 2009, per area



Appendix H: The five curricula of the Master in human medicine existing in Switzerland

Curricula					
Master	Zurich	Bern	Basel	Geneva	Lausanne
1st year	<p>Core study (456 h in courses and 216 h clinical education): <i>10 thematic blocks:</i> - 4 w. psychology & comportment - 3 w. sense organs, face, throat - 4 w. nervous system - 3 w. methabolism, endocrinal organs - 3 w. blood, tumors - 1.5 w. skin, dermatology - 3 w. childhood, adolescence, senium - 4 w. kidney, water balance - 1.5 w. social, legal, ethnical medicine - 2 w. emergencies Major study 4 h per week: either bio medicine or clinical medicine</p>	<p>Sept-Dec: -14 w. introduction into practice "courses and clinical practice" -3 w. preparation time for exams</p> <p>Feb-Nov (24 w.): Thematic blocks: - 5 x 4 w. clinical practice - 1 x 3 w. practice at general practitioner - 1 x 1 w. practice at anesthetist -8 weeks: Master thesis -9 weeks: holidays</p>	<p>Sept-Dec (14 weeks): - 4 w. cardiovascular - 3 w. endocrinal systems - 4 w. musculoskeletal system - 3 w. respiratory system</p> <p>Mar-Jun (14 weeks): - 2 w. boundry layer - 4 w. blood, infections, resistance - 4 w. digestive tract - 3 w. kidney</p>	<p>Sept-Dec: - 15 w. UIDC (Introduction into clinical procedures), incl. basics in radiology, pathology, ORL, ophthalmology and dermatology - 2 w. exams</p> <p>Feb-Jun: - 8 w. internal medicine (semiology, pharmacology, medical sicence, nephrology, quality of care, pathology, legal medicine, radiology) - 8 w. communication & medic first aid / emergencies - 3 w.: exams - 8 w. pediatrics</p>	<p>Sept-Dec (17 weeks): - 7 w. Arthralgia (orthopedy, rheumatology, immunology, ORL, deramthology, ophptomology) - 7 w. Mother&child (gynecology, genetics, neonatology) - 3 w. Generalist (internal & general medicine, urology, geriatrics, psychology)</p> <p>Mar-Jul (16 weeks block causes) - psychology, pneumology, pediatrics, ORL, gynecology, surgery</p>
2nd year	<p>Practical year - 10 months</p>	<p>Dec- Mar: - 14 w. final courses part 1 - 3 w. preparation time for exams and Master thesis</p> <p>Mai-Jan: Practical year -30 weeks -11 weeks holidays</p>	<p>Thema: - nervous system - psychatry / ethic / legal medicine - reproduction - scientificl cometencies</p> <p>Practical year</p>	<p>Thematic blocks: - 8 w. surgery - 4 w. psychiatry - 4 w. gynecology - 3 w. exams - 2x2 w. neuro-ophthalmology - 2x2 w. ORL-dematology - 4 w. emergencies - 4 w. Master thesis - 4 w. exams</p>	<p>Themathic blocks: - 3 w. scientificl competencies - 4 w. endocrinology, surgery, psychiatry - 4 w. oncology, infect., hematology - 3 w. legal medicine, hematology, immunology, surgery, neurosurgery, genetics, pharmaceuticals 3 w. transplantation, palliative, sexology - 3 w. Generalist II (internal & general medicine)</p> <p>Mai - Apr: Practical year: 10 months training and finish of Master thesis</p>
3rd year	<p>Core study (600 h courses and 200 h clinical practice): - 400 h courses (symptom oriented, incl. differential diagnostic thoughts) - 200 h repetition as preparation for the state examination - 200 h clinical practice as group lessons and staggered, at different clinics and instituts</p>	<p>Feb-Mai: -14 w. final courses part 2 - 4 w. preparation time for exams and Master thesis</p>	<p>Master thesis Emergencies</p>	<p>Practical year - 40 weeks</p>	<p>- 6 w. repetition knowledge and clinical practice</p>

Appendix I: Feasibility of the modules offered at Unil

Modules	Feasible with support	Feasible with strong support	Not feasible
Douleurs articulaires	X		
Mère-enfant			X
ORL, Dermatologie, Ophtalmologie			X
Généralisme I	X		
MICS, Médecine, individu, communauté société	X		
Travail de Maîtrise	X		
Maladies chroniques et complexes		X	
Oncologie, Maladies infectieuses, Hématologie	X		
Cours cliniques généraux		X	
Cours coordonnés			X
Généralisme II	X		

Appendix J: Feasibility of the modules offered at UZH

Modules	Feasible with support	Feasible with strong support	Not feasible
Psyche und Verhalten			X
Sinnesorgane, Gesicht, Hals			X
Nervensystem		X	
Stoffwechsel / Endokrine Organe		X	
Haut			X
Sozialmedizin, Recht und Ethik	X		
Lebensabschnitte Kindheit, Adoleszenz und Senium		X	
Blut / Neoplasien	X		
Niere, Elektrolyte, Wasserhaushalt		X	
Notfallmedizin	X		

Appendix K: Costs and revenues for starting the Master

Model based on data from FSO	1st year	2nd year	3rd year	steady year-over-year costs
Costs for the basic education (70'000 CHF per student, per year)	4'900'000	9'800'000	14'700'000	14'700'000
Start-up costs (5 mio. amortised over 10 years)	500'000	500'000	500'000	500'000
Costs for adm. and mgmnt. (infrastructure for research and in clinics)	1'500'000	2'000'000	3'000'000	3'000'000
Total costs for the basic education	6'900'000	12'300'000	18'200'000	18'200'000
Federal revenues LAU (14'000 CHF per student)	980'000	1'960'000	2'940'000	2'940'000
Revenues IA from other cantons * (48'600 CHF per student)	2'187'000	4'374'000	6'804'000	6'804'000
Revenues IA for ticinese students * (48'600 CHF per student)	1'215'000	2'430'000	3'402'000	3'402'000
Revenues student fees (4'000 CHF per student)	280'000	560'000	840'000	840'000
Cantonal contribution based on the Contract of Services (30%)	1'398'600	2'797'200	4'195'800	4'195'800
Total revenues for the basic education	6'060'600	12'121'200	18'181'800	18'181'800
Gain / loss	-839'400	-178'800	-18'200	-18'200
<i>* Master students</i>	<i>70</i>	<i>140</i>	<i>210</i>	
<i>of which, Ticinese (estimate)</i>	<i>25</i>	<i>50</i>	<i>70</i>	
<i>of which, from other cantons (estimate)</i>	<i>45</i>	<i>90</i>	<i>140</i>	