



Businessplan of a MRT Laboratory

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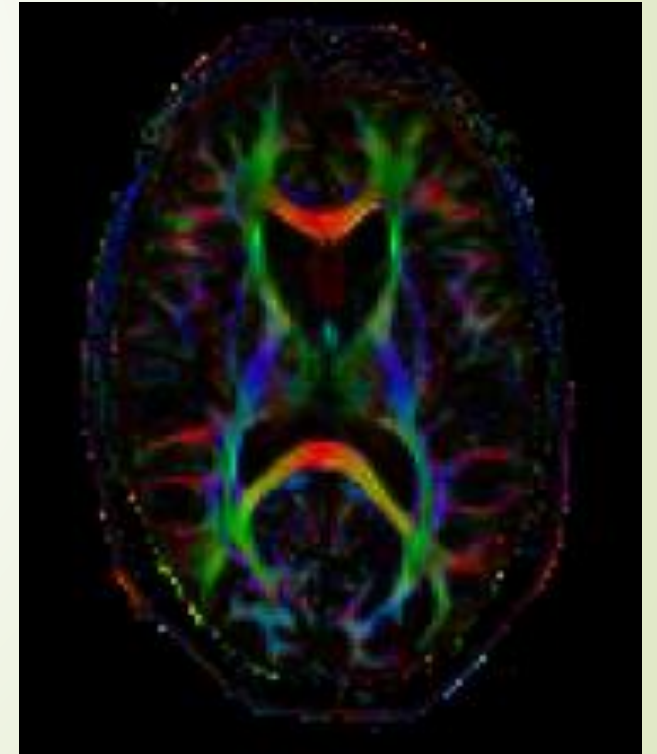
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- MRT
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Motivation

- MRT is a very important analytical method in the medicine
 - Will be always needed
- A long waiting periode
- A long approach




MRT-Magnetic resonance tomography

- ▶ a medical imaging technique used in radiology to investigate the anatomy and function of the body in both health and disease
- ▶ over 25,000 scanners in use worldwide
- ▶ Many special methods of MRT





MRT-Magnetic resonance tomography

- ▶ Real-time MRT to present moving joints or organs (eg heart)
 - ▶ The magnetic resonance angiography (MRA) for the representation of the vessels,
 - ▶ functional magnetic resonance imaging (fMRI or fMRI) of the brain,
 - ▶ the perfusion MRI for the investigation of tissue perfusion,
 - ▶ the diffusion or diffusion tensor imaging (DTI) for a virtual reconstruction of nerve fiber connections,
 - ▶ MR elastography.
- 

MRT-Magnetic resonance tomography History

- ▶ from 1973 Paul C. Lauterbur and Sir Peter Mansfield had the fundamental ideas to produce a MRT
- ▶ At 2003 they get the Nobel prize for physiology and medicine
- ▶ The firm Bruker in Karlsruhe, Germany, was the first firm, which produced the necessary „pulsed NMR-spectrometer,,
- ▶ In the middle of the eighties MRT was applied in medicine



Paul C. Lauterbur

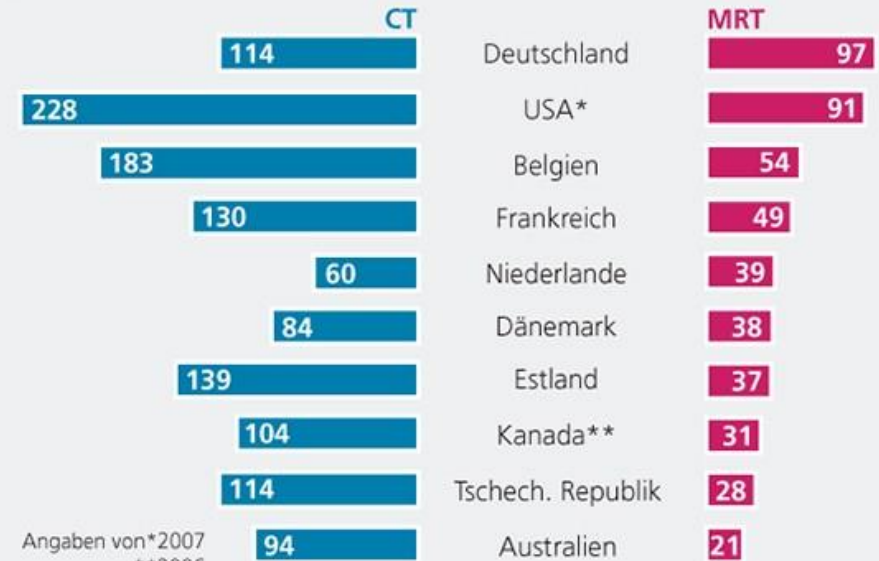


Peter Mansfield

Market analysis

Deutschland bei MRT Spitze

Computer- und Magnetresonanztomografie-Untersuchungen
je 1000 Einwohner in den Jahren 2008/09



Angaben von*2007
**2006

Quelle: OECD Health Data 2010, BARMER GEK Arztreport 2011

Grafik: **ÄRZTE+ZEITUNG**

- In Germany nearly 10 % gets a MRT research
- Germany is front-runner of MRT researchs

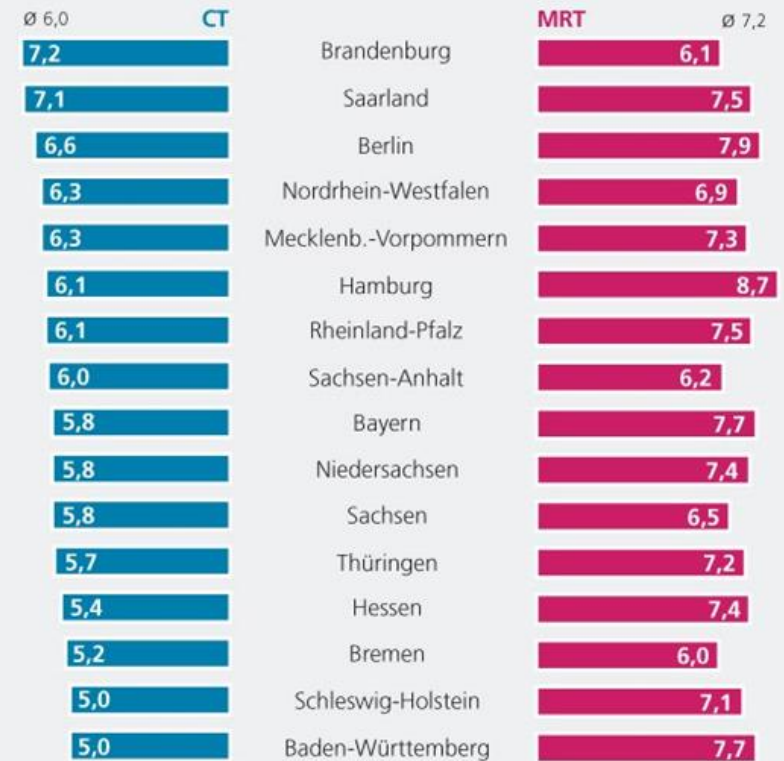
[a]

Market analysis (2)

- ▶ Hamburg has the most MRT analysis
- ▶ Bremen has at least analysis
- ▶ Nordrhein-Westfalen lies in the middle field

Hohe MRT-Auslastung in Ballungsgebieten

Untersuchungen pro Betroffenen im Jahr (2009)

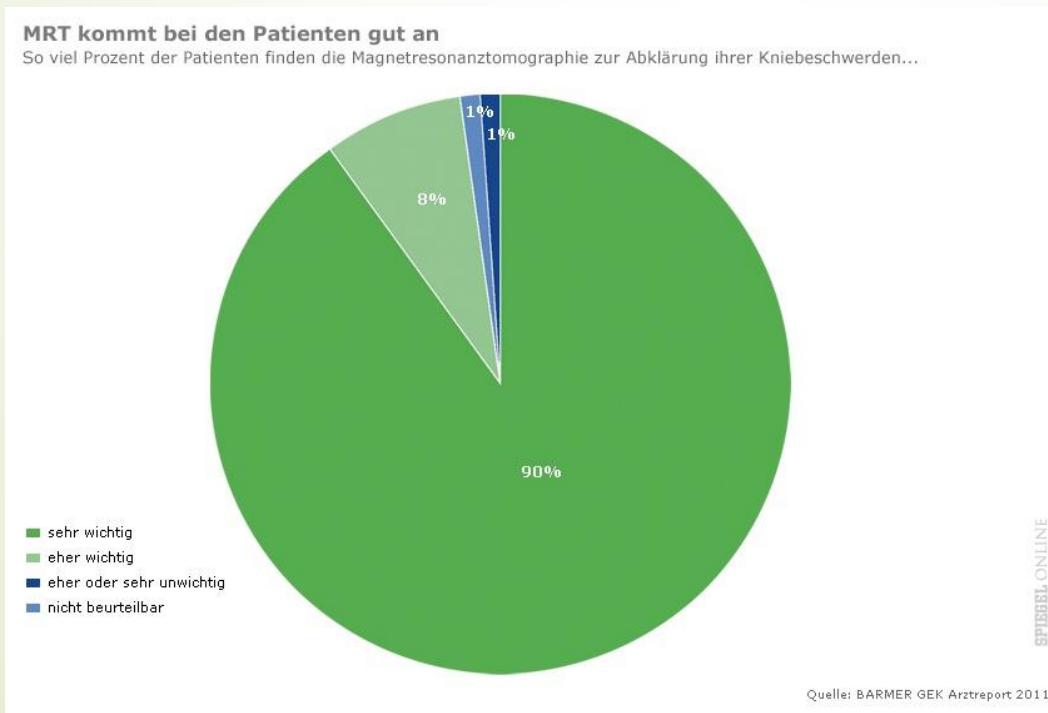


Quelle: BARMER GEK Arztreport 2011

Grafik: **ÄRZTE#ZEITUNG**

Market analysis (3)

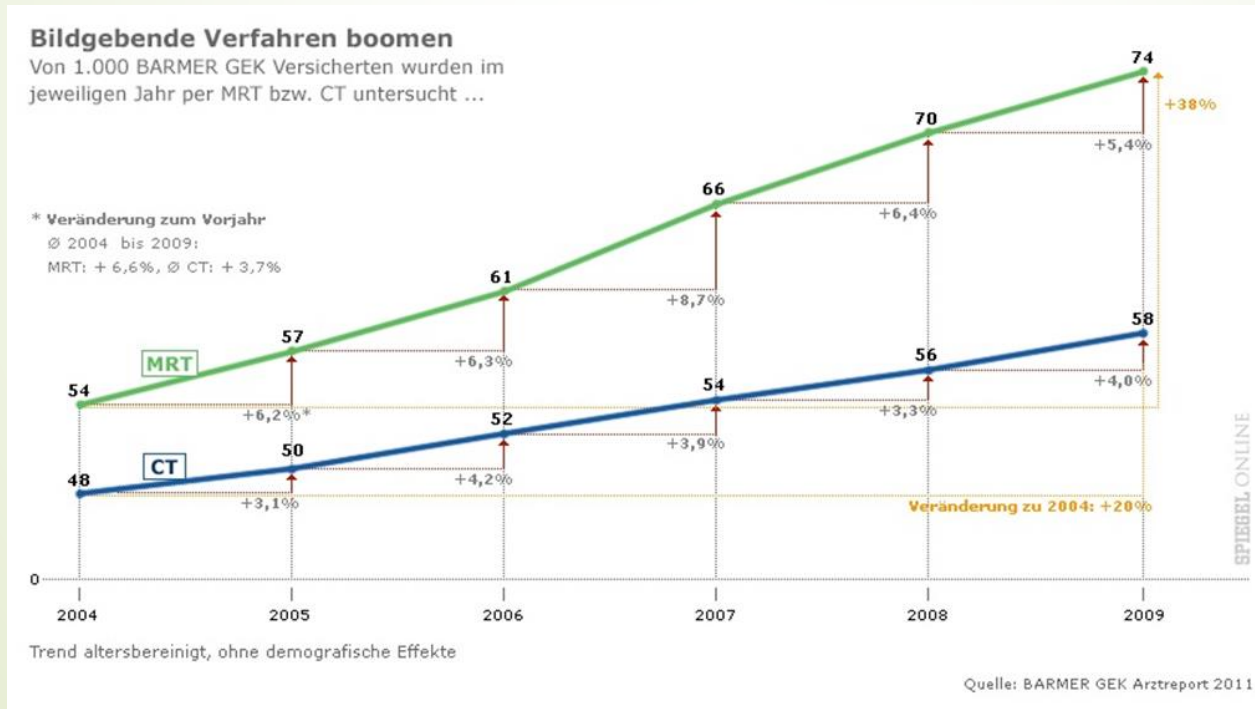
- The patients think, that MRT-analysis are important
- They accept a high price



[b]

Market analysis (4)

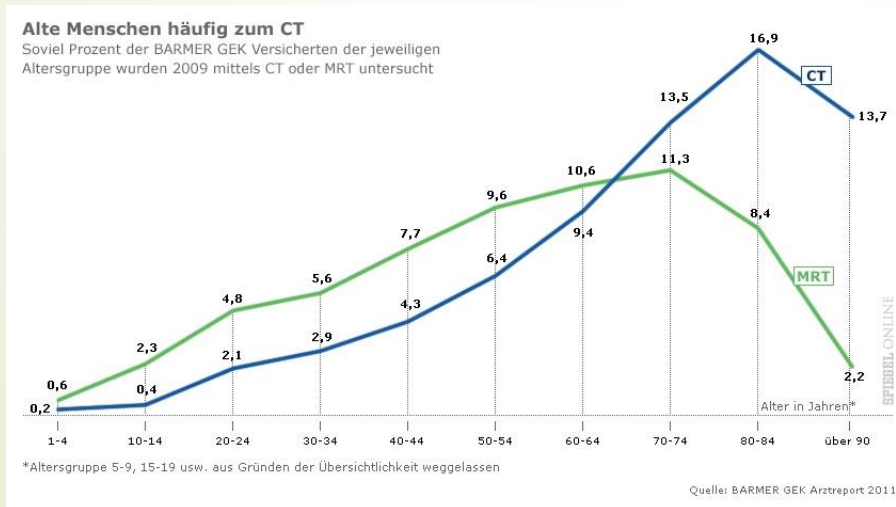
- Number of the analysis increase continuing
- After five years the number of analysis increase of 38 %



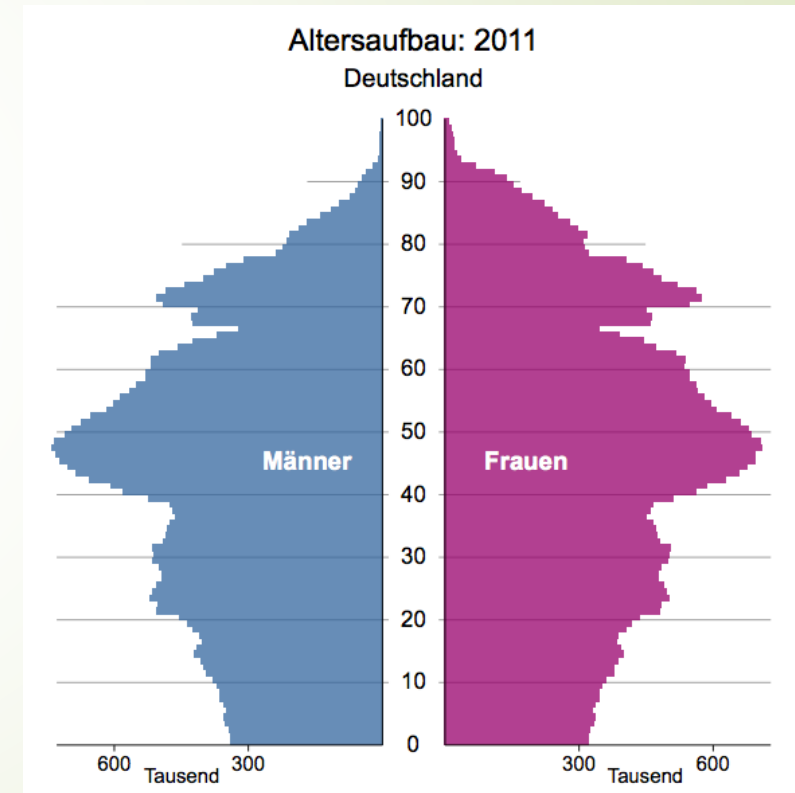
[b]

Market analysis (5)

Because of the demographic change the number of potential analysis will increase



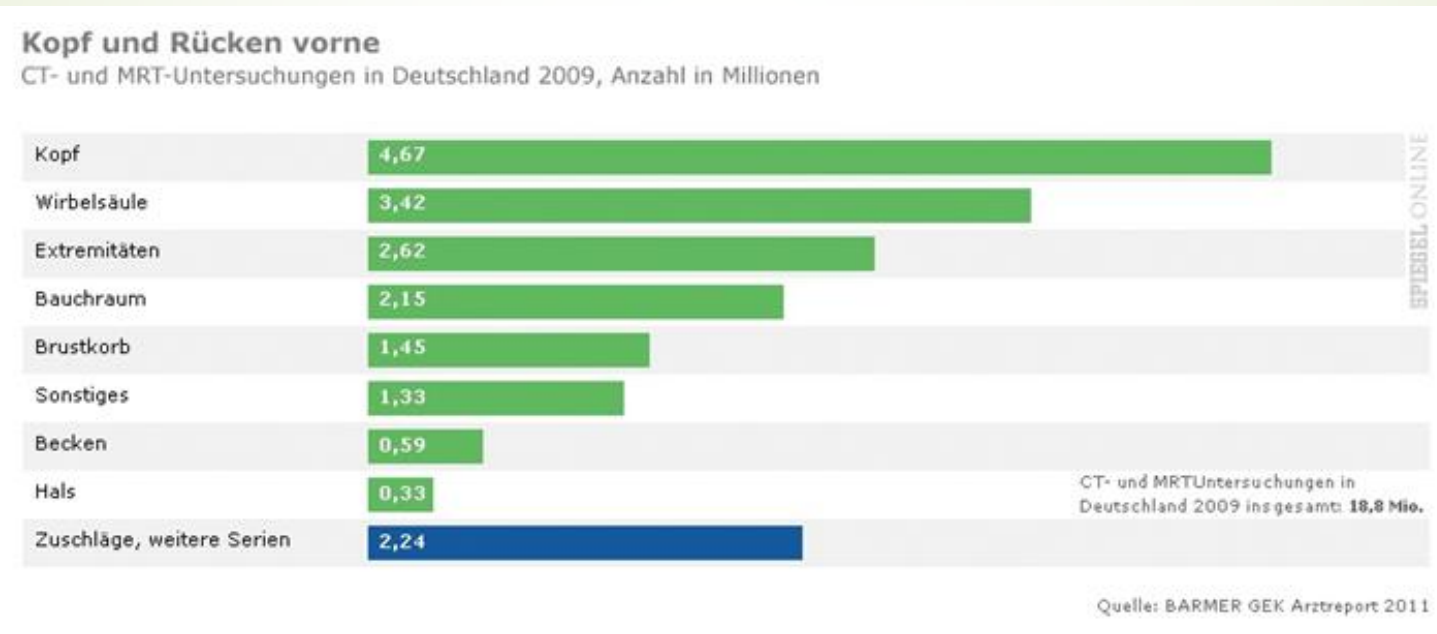
[b]



[d]

Market analysis (6)

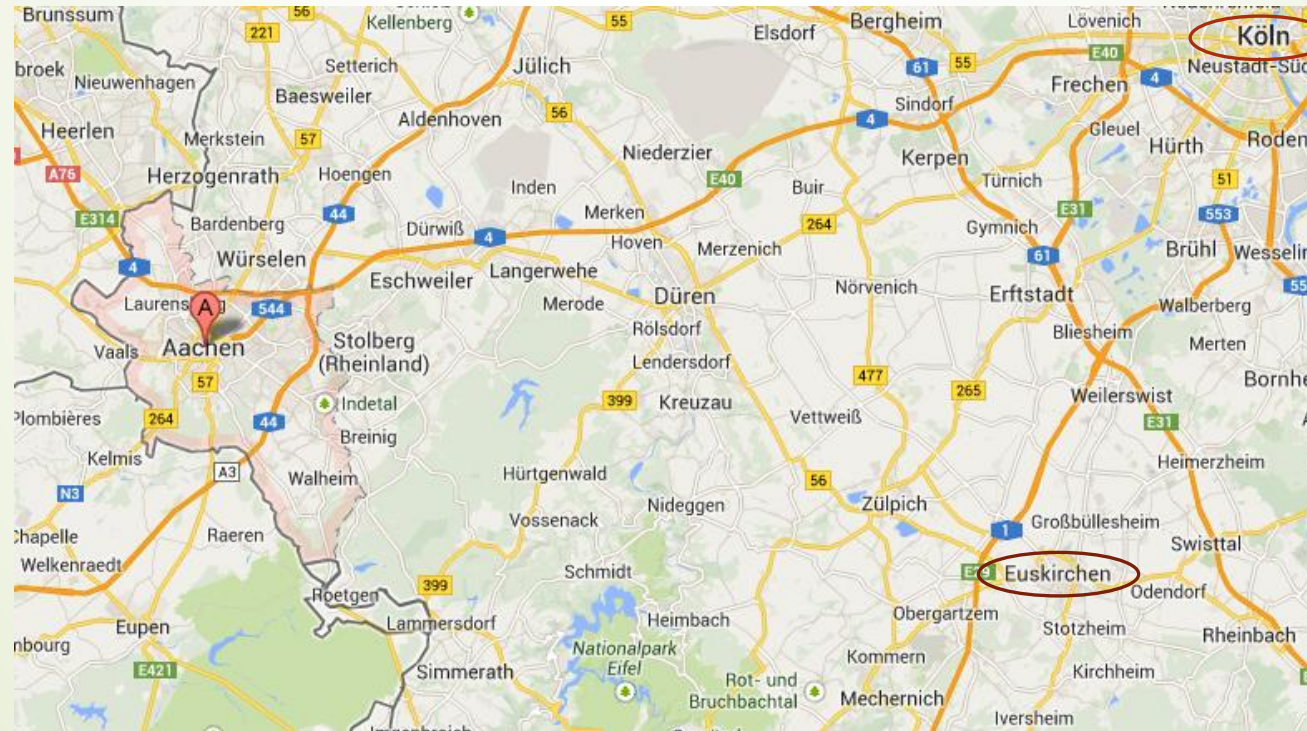
- ▶ three percent of the medical costs in the ambulant area
- ▶ 1,76 billion euro per annum for CT und MRT-analysis [e]



[b]

Location

- Next MRT laboratories near Aachen are in Köln and Euskirchen [g]

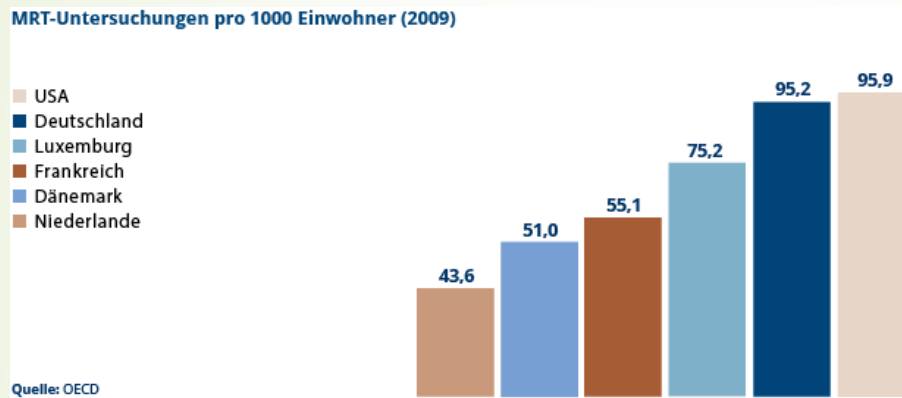


Location (2)

- Our MRT Laboratory will be in Stolberg
- Near to the autobahn A4 and A44
- Near to big cities like Aachen, Eschweiler and Düren
- Also a good train connection



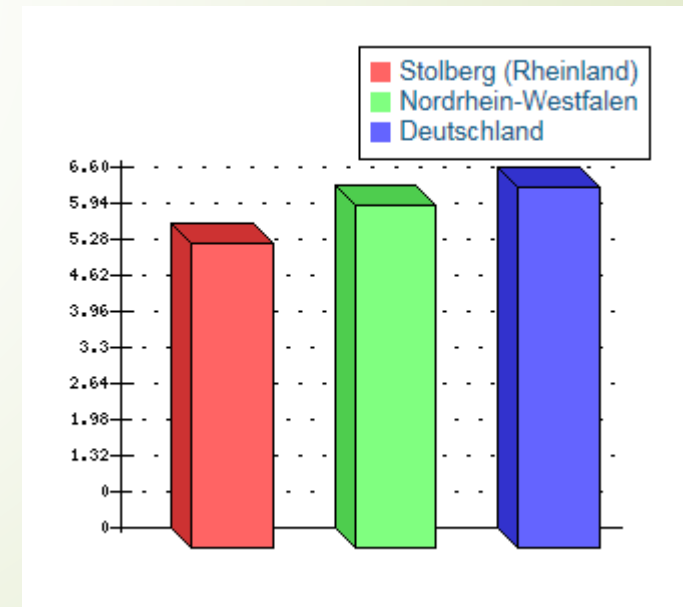
Location (3)



also in Stolberg are the rental prices very low

- Stolberg is near to the Netherlands and Belgium
- Maybe further patients

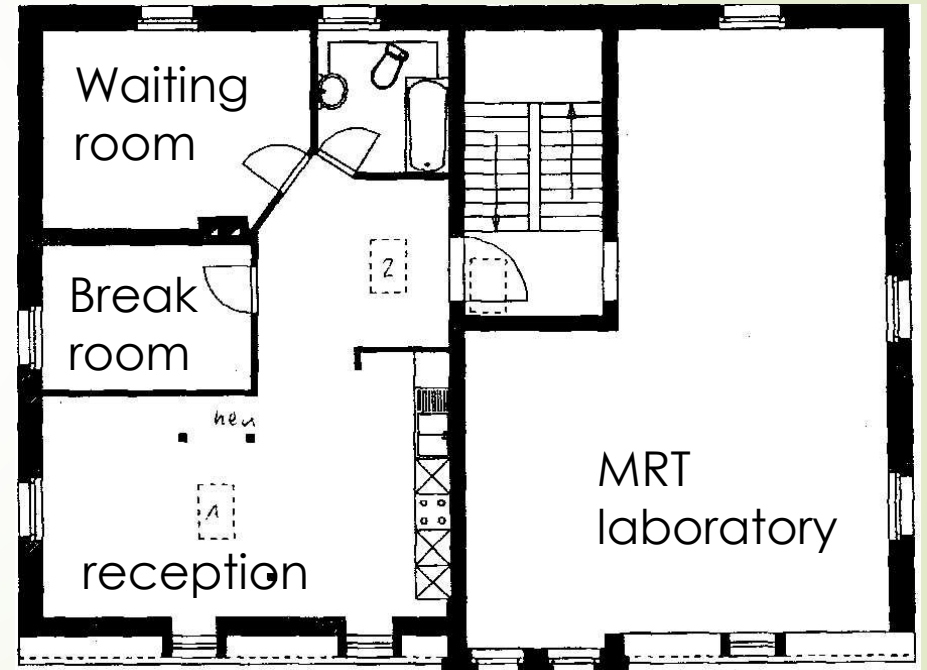
[c]



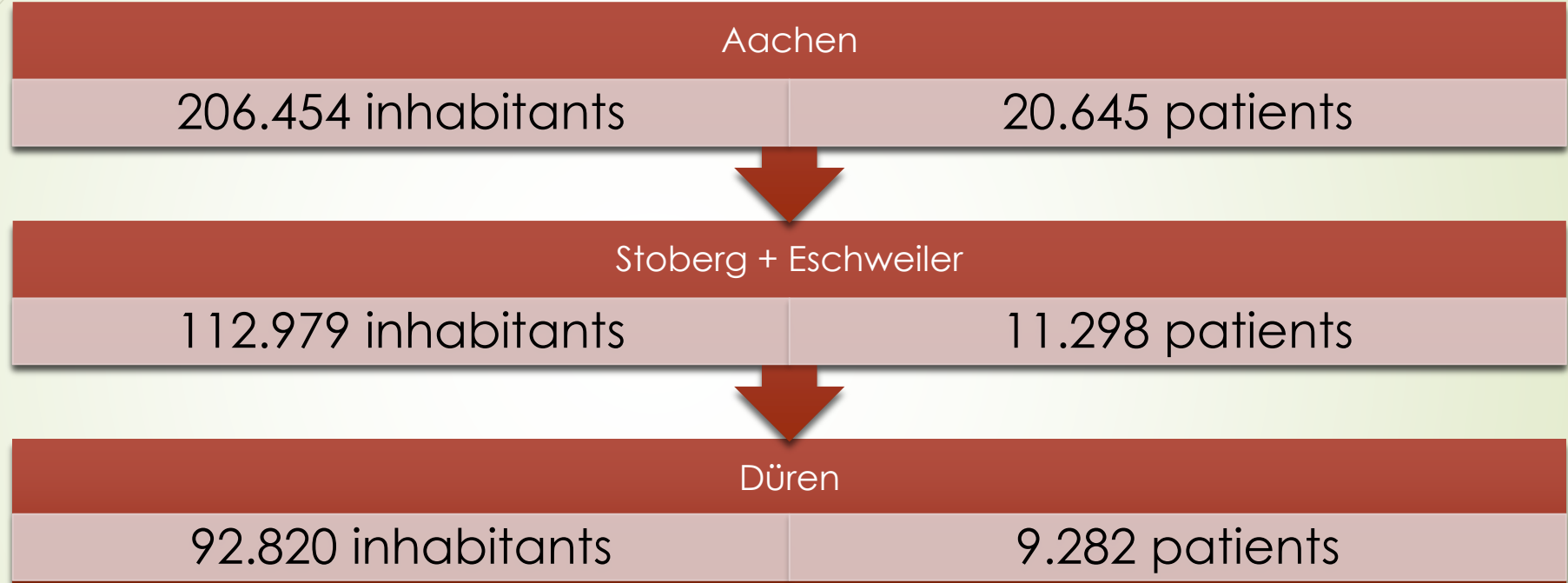
[f]

Location (4)

- 200-250 m²
- Waiting room
- Sanitation
 - For employees and patients
- Room for the MRT
- Reception
- Break room for the employees



Potential patients



41225 patients per annum

113 patients per day

Our laboratory will operate at full capacity

Working Schedule

Time	MRT lab assistant 1	MRT lab assistant 2	MRT lab assistant 3	doctor's assistant 1	doctor's assistant 2
6 a.m.	Present				
7 a.m.	Present				
8 a.m.	Present				Present
9 a.m.	Present				Present
10 a.m.	Present	Present			Present
11 a.m.	Present	Present			Present
12 a.m.	Present	Present			Present
1 p.m.	Present	Present		Present	
2 p.m.		Present	Present	Present	
3 p.m.		Present	Present	Present	
4 p.m.		Present	Present	Present	
5 p.m.		Present	Present	Present	
6 p.m.			Present	Present	
7 p.m.			Present		
8 p.m.			Present		

Calculations

From 6 to 9
a.m.
3 measures

From 9 a.m. to
6 p.m.
16 measures

From 6 to 8
p.m.
2 measures

Conclusion:
21 measures
per day are
realistic

Average earnings
per measure

- Average 132€
- For panel patients ca 120€, for privat patients more

Average time for
the measure

- Half an hour
- Additionally preparing time

Average
earnings for
a working
day: 2772€

Calculations (2)



Empolyees

Doctor's assistant

Two persons:
One at full time working and one half time

Basic salary for a doctor's assistant is ca 3000€

MRT lab assistant

Four persons:
Balancing vacations and illness

Basic salary for a MRT lab assistant is ca 2500€

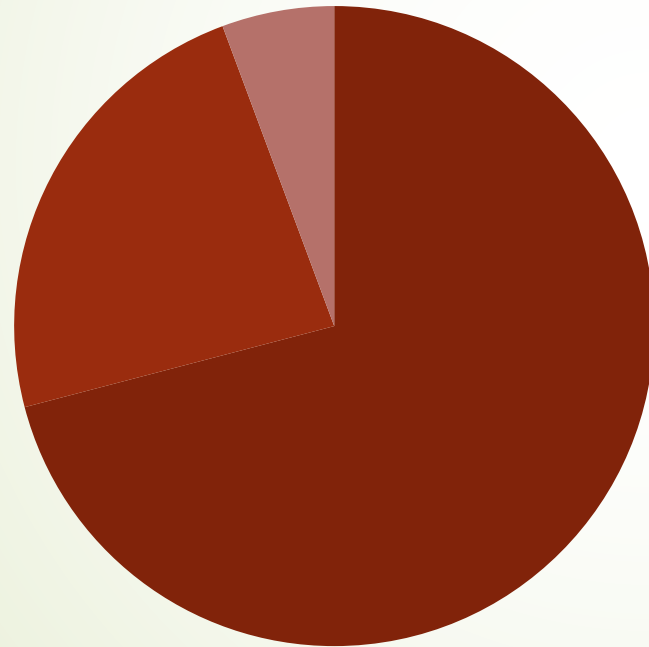
A cleaner on the basis of 450€

Calculations (3)

Equipment	Investment costs	How many times?
MRT	2.000.000€	One-time
Fixtures	50.000€	One-time
Renovation costs	50.000€	One-time
Lease costs	2.000€	Monthly
Computer software	250€	Monthly
Electricity costs	5.287,50€	Monthly
Personnel costs	17.100€	Monthly
Service and training costs	5.833,33€	Monthly

Calculations (4)

Electricity costs



- MRT (3750€)
- air conditioning (1237,50€)
- rest (300€)

[h]

Calculations (5)

Monthly fixed costs:
30.970,83€

Concluding the
„unexpected“:
Credit of 2.300.000€

Investing and the
costs for 3 month:
2.192.913€

Over 11 years the
annually pay back:
209.090,90€

Monthly pay back:
17.424,24€
Monthly fixed costs:
48.395,07€

Calculations (6)

Year	Balance of debt [€]	interest rate	interest [€]	payback loan [€]
1	2300000	7%	161000	209091
2	2090909	7%	146364	209091
3	1881818	7%	131727	209091
4	1672727	7%	117091	209091
5	1463636	7%	102455	209091
6	1254546	7%	87818	209091
7	1045455	7%	73182	209091
8	836364	7%	58545	209091
9	627273	7%	43909	209091
10	418182	7%	29273	209091
11	209091	7%	14636	209091
		Total interest	966000	
		Total payment		2300000

Calculations (7)

Depreciation	Per annum	Current time
MRT	200.000€	10 years
Labor costs	275.200€	1 year
Fixtures	5.000€	10 years
Renovation	2.500€	10 years
=> sum	482.700€	

Calculations (8)

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year	11 Year
Turnover	698544	698544	698544	698544	698544	698544	698544	698544	698544	698544	698544
Depreciating cost	482700	482700	482700	482700	482700	482700	482700	482700	482700	482700	275200
Financing cost	161000	146364	131727	117091	102455	87818	73182	58545	43909	29273	14636
Fixed cost	371650	371650	371650	371650	371650	371650	371650	371650	371650	371650	371650
Losses carried forward	0	316806	618976	906509	1179406	1437666	1681290	1910278	2124630	2324345	2509423
Profit before taxes	-316806	-618976	-906509	-1179406	-1437666	-1681290	-1910278	-2124630	-2324345	-2509423	-2472366
Taxes (40%)	0	0	0	0	0	0	0	0	0	0	0
Profit after taxes	-316806	-618976	-906509	-1179406	-1437666	-1681290	-1910278	-2124630	-2324345	-2509423	-2472366
Cash flow	165894	-136276	-423809	-696706	-954966	-1198590	-1427578	-1641930	-1841645	-2026723	-2197166
Repayment credit	209091	209091	209091	209091	209091	209091	209091	209091	209091	209091	209091
Dividend	-43197	-345366	-632900	-905797	-1164057	-1407681	-1636669	-1851020	-2050735	-2235814	-2406257



Conclusion

- ▶ Our business is not cost-effective
- ▶ After 11 years over 14,7 million debt
- ▶ After 11 years the MRT must be exchanged
 - ▶ New credit over 2.000.000€

Solutions

- ▶ A higher price for a measure
 - ▶ People can accept a increase
- ▶ Subsidies from state

Conclusion (2)

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year	11 Year
Turnover	940000	940000	940000	940000	940000	940000	940000	940000	940000	940000	940000
Depreciating cost	482700	482700	482700	482700	482700	482700	482700	482700	482700	482700	275200
Financing cost	161000	146364	131727	117091	102455	87818	73182	58545	43909	29273	14636
Fixed cost	371650	371650	371650	371650	371650	371650	371650	371650	371650	371650	371650
Losses carried forward	0	75350	136064	182141	213582	230386	232554	220086	192982	151241	94863
Profit before taxes	-75350	-136064	-182141	-213582	-230386	-232554	-220086	-192982	-151241	-94863	183650
Taxes (40%)	0	0	0	0	0	0	0	0	0	0	73460
Profit after taxes	-75350	-136064	-182141	-213582	-230386	-232554	-220086	-192982	-151241	-94863	110190
Cash flow	407350	346636	300559	269118	252314	250146	262614	289718	331459	387837	385390
Repayment credit	209091	209091	209091	209091	209091	209091	209091	209091	209091	209091	209091
Dividend	198259	137546	91468	60027	43223	41055	53523	80628	122369	178746	176299

Conclusion (3)

- At 940.000€ the business is cost-effective
 - A measure have to cost 180€
- Or ca 240.000€ from subsidies per annum
 - Mayby research funds
 - Not only measures of patients
 - Contract with a institution



Source

- [a] <http://www.aerztezeitung.de/extras/fotos/?sid=639169&sh=0>
- [b] <http://www.spiegel.de/wirtschaft/soziales/studie-deutsche-patienten-sind-rekordhalter-bei-kernspin-untersuchungen-a-742897.html>
- [c] <https://faktencheck-gesundheit.de/tipps-und-hilfen-fuer-patienten/untersuchungen-und-befunde/infos-zu-roentgen-ct-und-mrt/>
- [d] <http://3.bp.blogspot.com/-O6Lrn3lpkNE/TangHJGAZbl/AAAAAAAAABFU/rZpvOg1SUAo/s640/Bev%25C3%25B6lkerungspyramide+2011+Deutschland.png>
- [e] <http://www.barmer-gek.de/barmer/web/Portale/Presseportal/Subportal/Presseinformationen/Archiv/2011/110201-Arztreport-2011/Pressemappe-Arztreport-2011,property=Data.pdf>
- [f] <http://www.wohnungsboerse.net/mietspiegel-Stolberg-Rheinland/5175>
- [g] <http://www.ismrm.de/mr-labore-in-dach.html>
- [h] The company Philips

The Philips logo, consisting of the word "PHILIPS" in a bold, blue, sans-serif font, is displayed on a white rectangular background.