World fire statistics

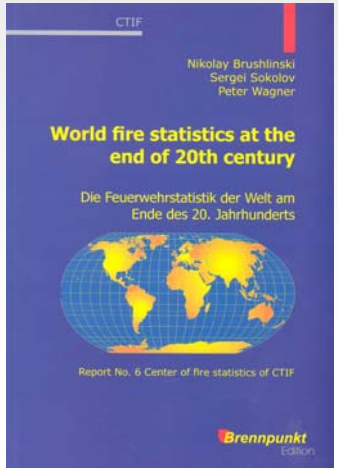
Report № 10
of Centre of Fire Statistics of CTIF
by

Prof. Dr. N.N. Brushlinsky, Prof. Dr. S.V. Sokolov
(Moscow Academy of State Fire Service, Russia)
Dr. Ing. P. Wagner (Berlin Fire Department, Germany)
Dr. J.R. Hall (National Fire Protection Association, USA)

1995 – 2005 Center of Fire Statistics of CTIF

1995

17 countries



2000

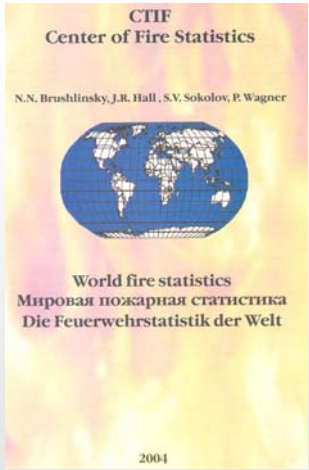
54 countries and 30 cities

(200 pp.)

2004

85 countries and 90 cities

(100 pp.)



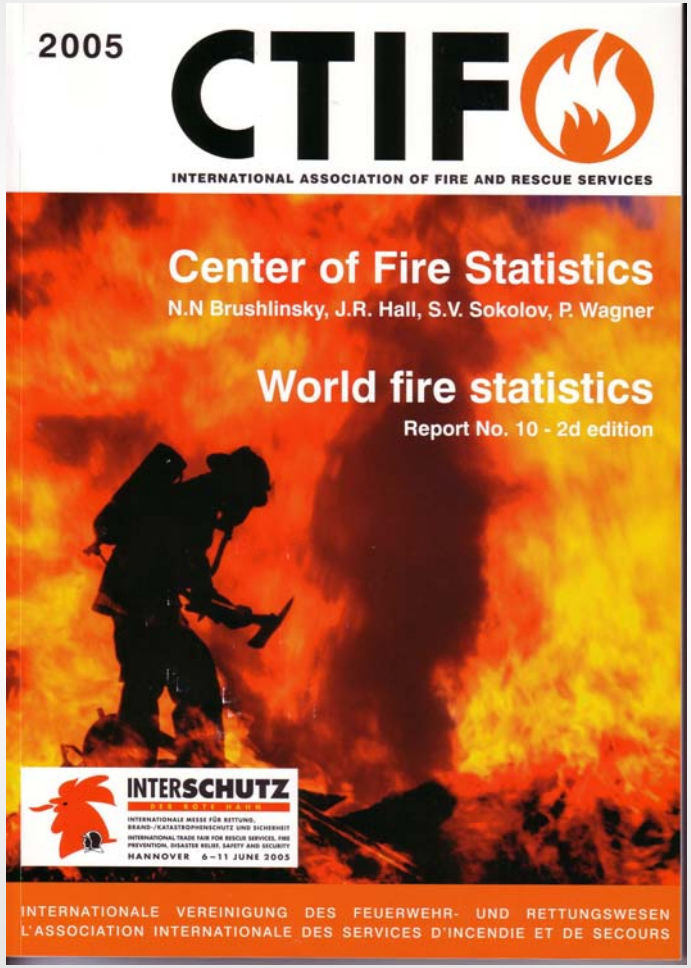
2005

85 countries and 90 cities

(200 pp.)

Report No. “10 World Fire Statistics 2005”

- Content of every year standard CTIF-Report (100 pages, English / German / Russian languages)
- Special article “Problems of Fire Safety in the World at the end of the 20th century” (100 pages, English / German / Russian languages)

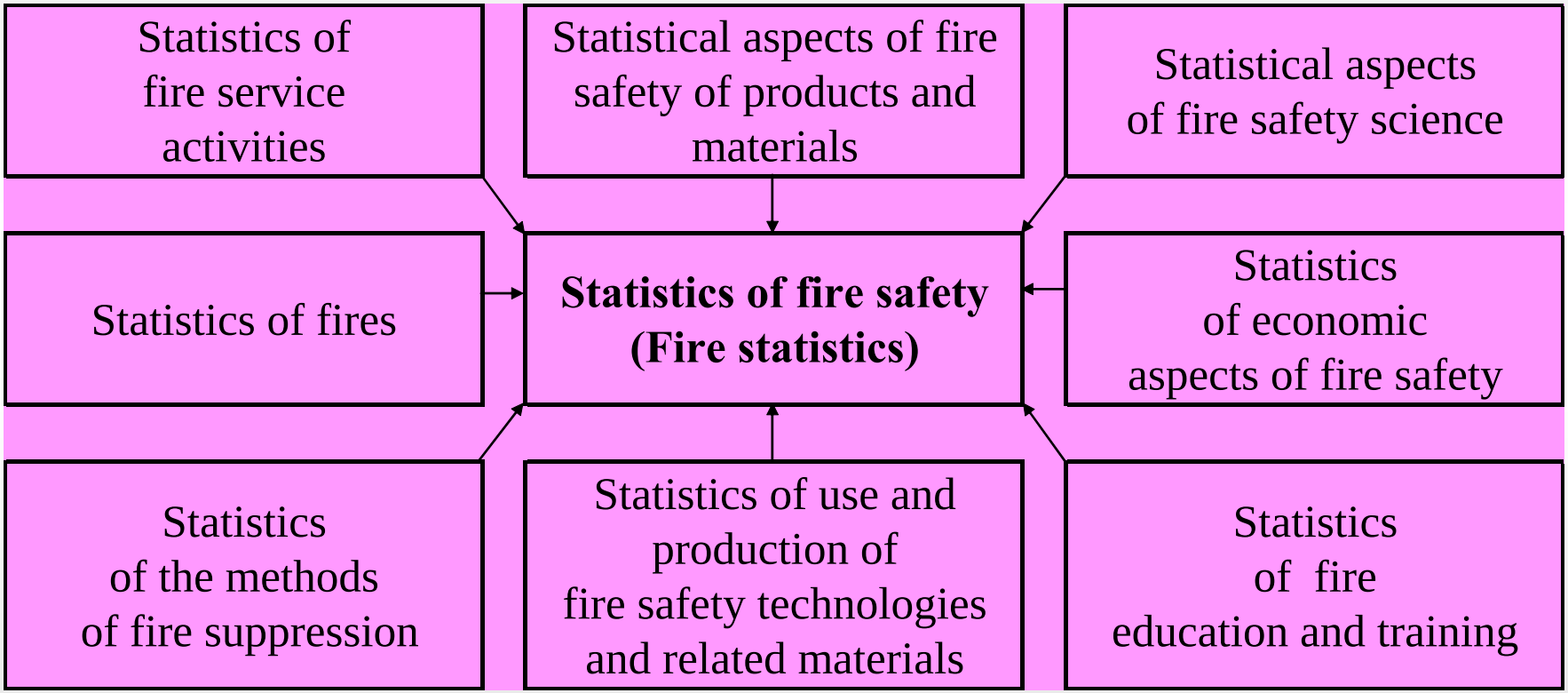


Content of every year standard CTIF-Report

- What are fire statistics?
- Who assembles international fire statistics?
- Trends in fire services activities in the countries of the world
- Trends in fire deaths in the countries of the world
- Problems of intentional fires in the world
- Economic-statistical evaluation of "costs" of fires in the world
- Fire experience in the counties at the current time
- Statistics of the fire service in the countries of the world
- Trends in fire experience in the cities of the world
- Fire experience in the largest cities of the world
- Statistics of fire services in the largest cities of the world
- Youth volunteer fire brigade auxiliaries in CTIF countries
- Global problem of forest fires
- Summary and Conclusions
- Data recording per questionnaire
- Data recording using the Internet
- Computer Simulation System CIS-KOSMAS for city emergency service analysis and deployment
- Experience of National Fire Statistics development using information technologies

Dr. Ing. Peter Wagner 2006

Main Parts of Fire Statistics

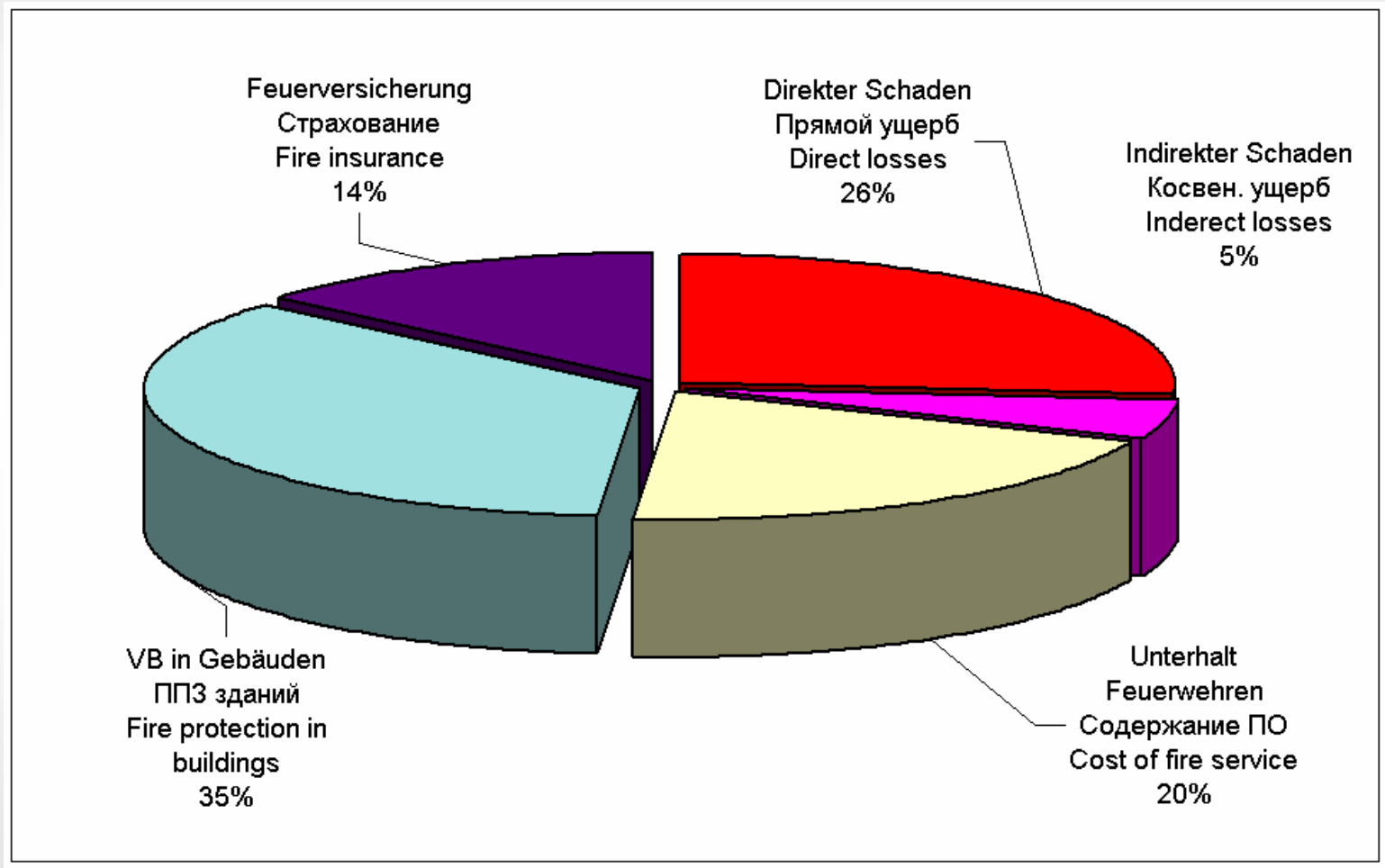


Fires and fire deaths in the World

- At the beginning of the 21th century, the population of the **Earth** is 6.300.000.000 inh., who annually experience a reported 7.000.000 - 8.000.000 fires with 70.000 – 80.000 fire deaths and 500.000 – 800.000 fire injuries.
- At the beginning of the 21th century, the population of the **Europe** is 700.000.000 inh., who annually experience a reported 2.000.000 - 2.500.000 fires with 20.000 – 25.000 fire deaths and 250.000 – 500.000 fire injuries.

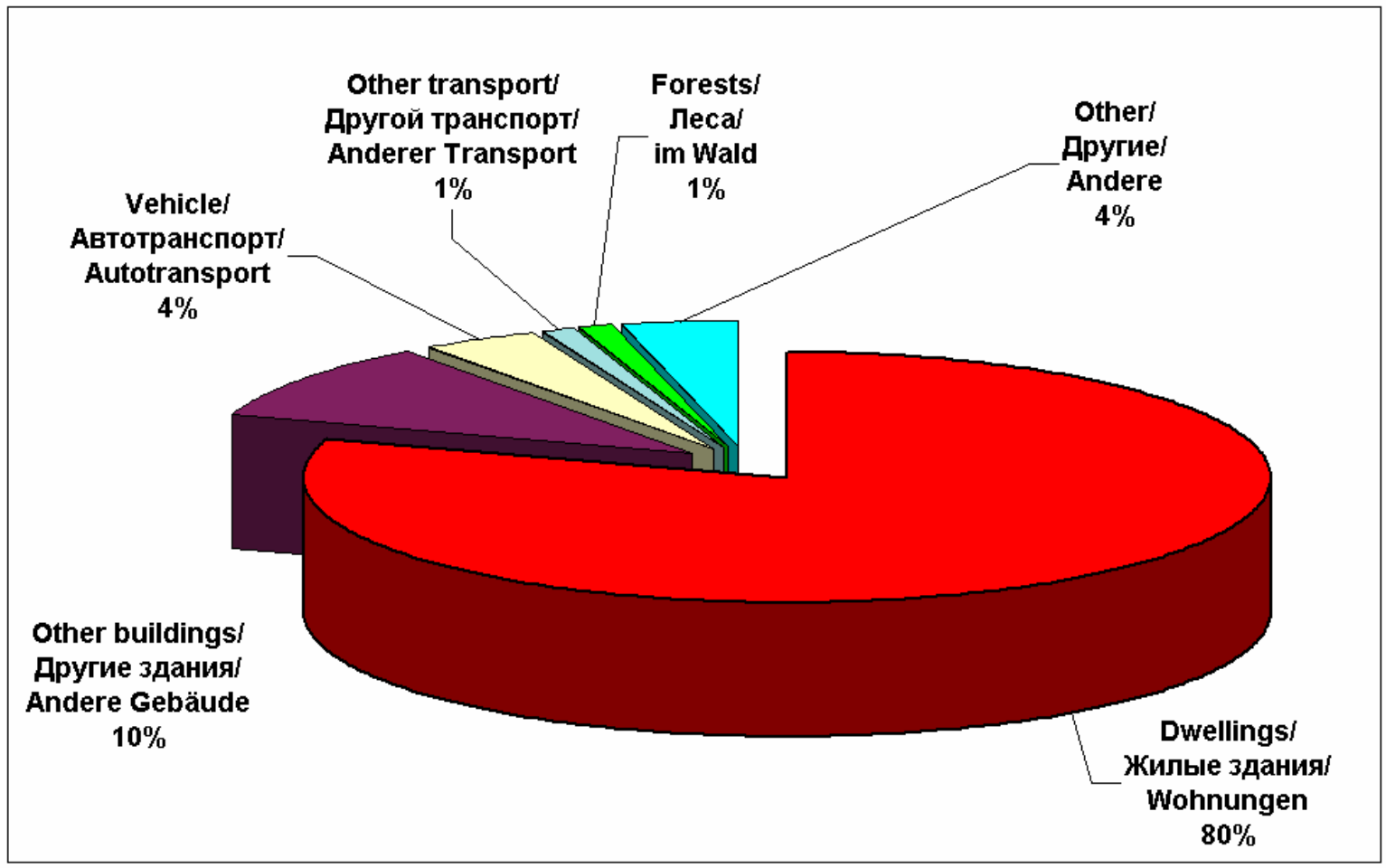
Dr. Ing. Peter Wagner 2006

Economic-statistical evaluation of "costs" of fires”

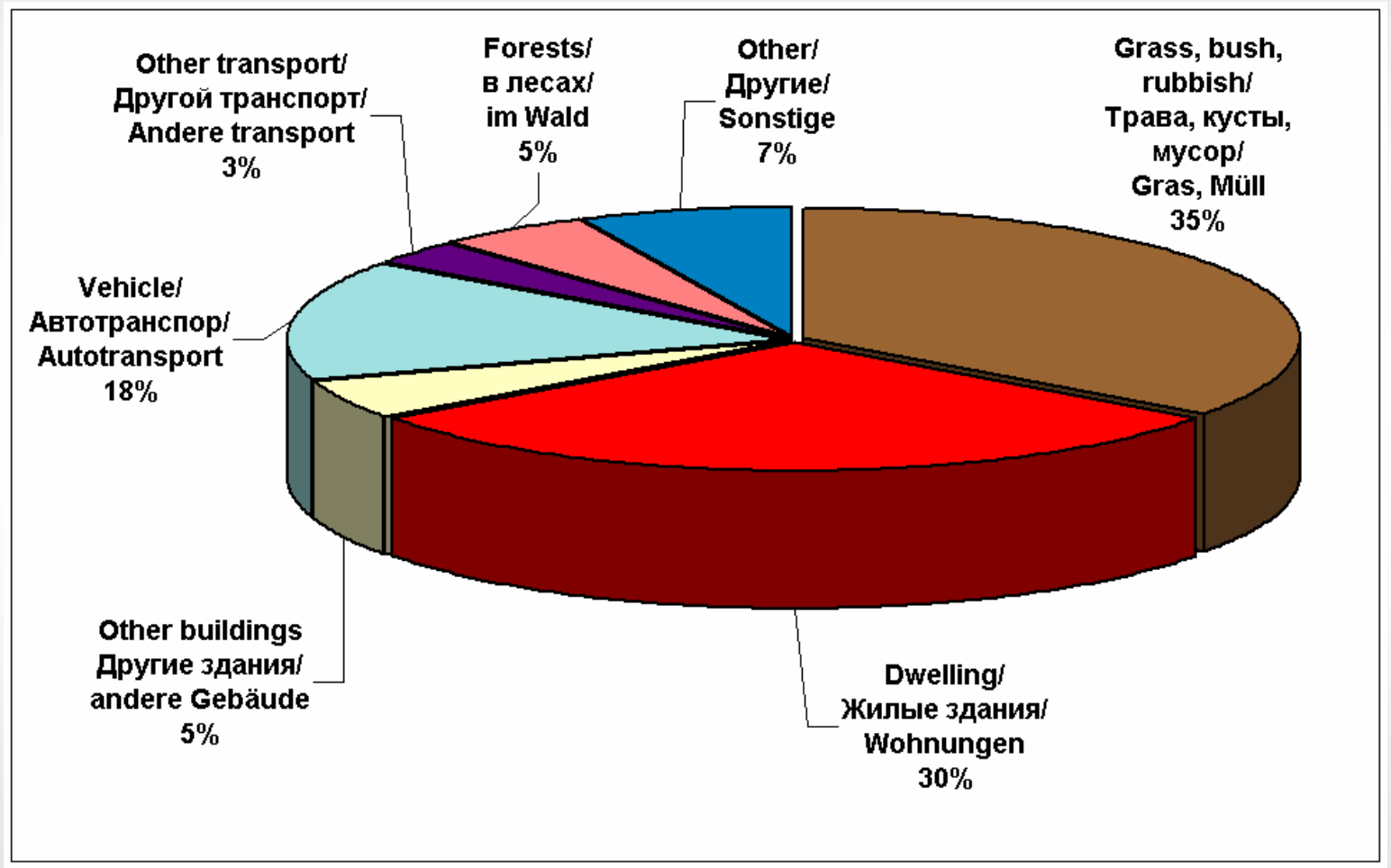


Dr. Ing. Peter Wagner 2006

General distribution of fire deaths by fire origin in countries of the world

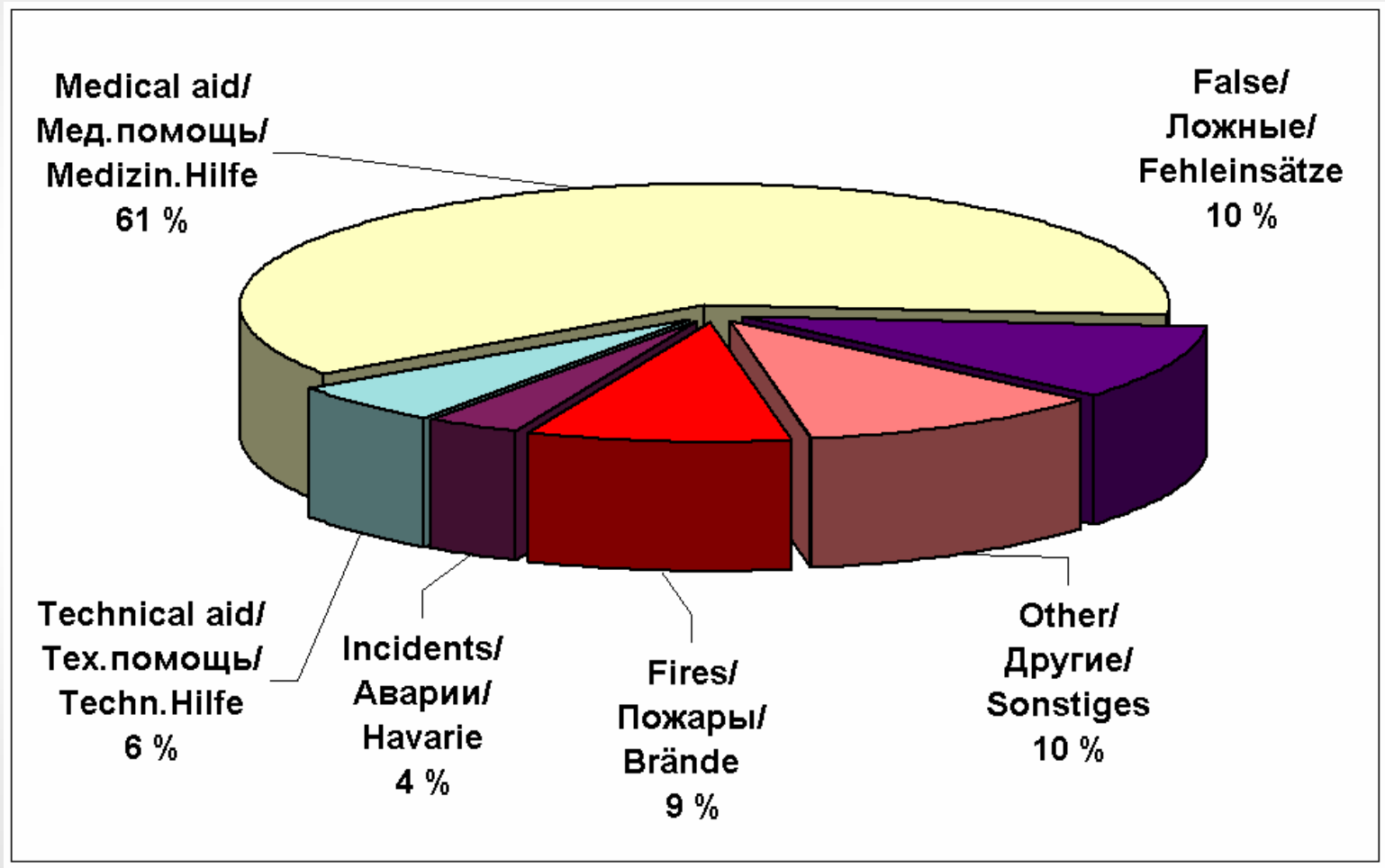


General distribution of fires by fire origin in countries of the world

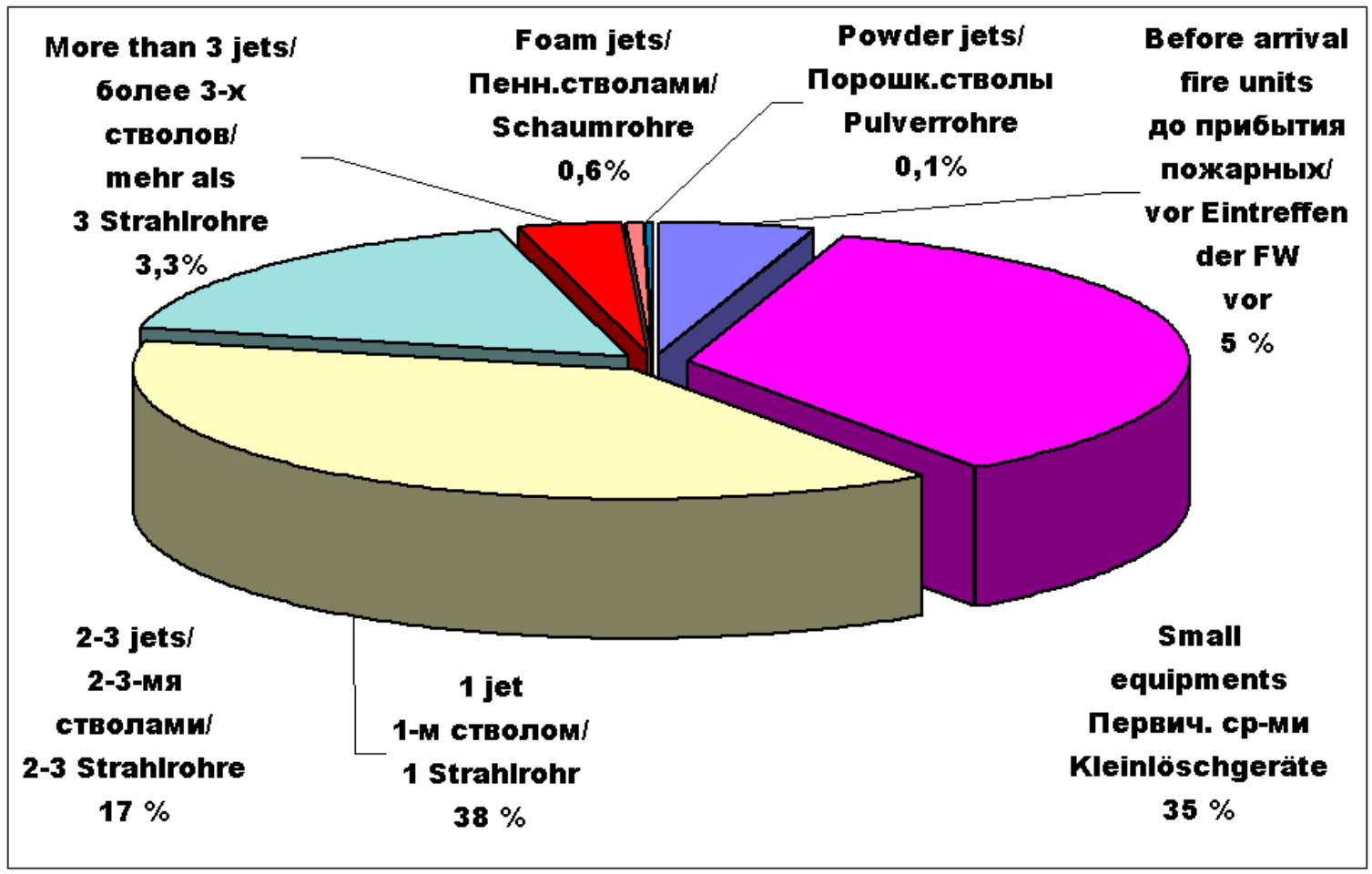


Dr. Ing. Peter Wagner 2006

General structure of calls of fire services in countries of the world

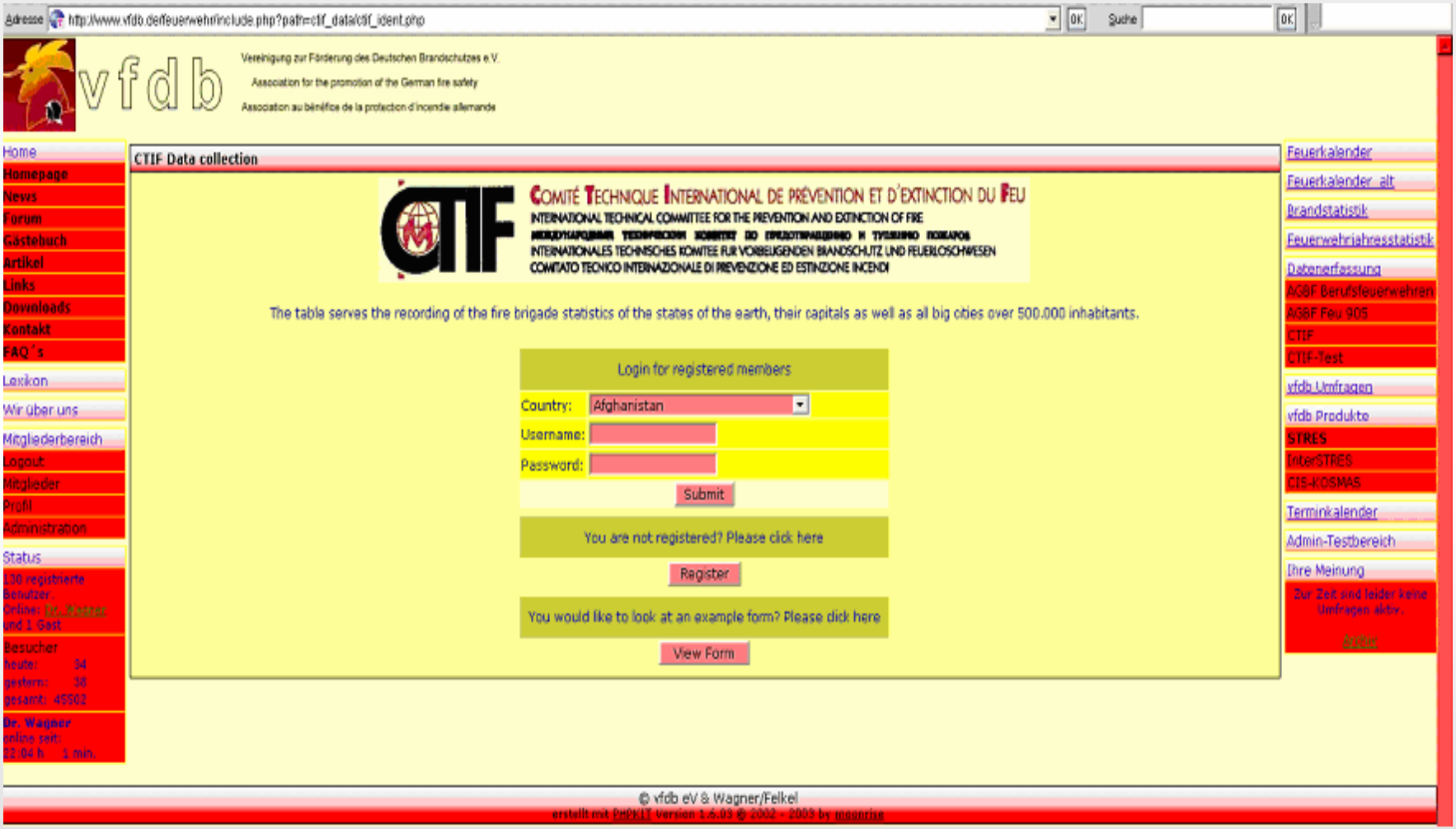


General distribution of fires by means of their extinguishing in countries of the world



Dr. Ing. Peter Wagner 2006

Data recording using Internet



Data recording per questionnaire

№¤	Statistical·data¤	Country¤	Capital¤
0¤	Year¤	2005¤	2005¤
1¤	Name·of·the·area:¤	¤	¤
1.1¤	Population·(thousands·inhabitants)¤	¤	¤
1.2¤	Area·(sq.km.)¤	¤	¤
2¤	**Total·number·of·calls·a·year:¤**	**¤**	**¤**
2.1¤	-·fires¤	¤	¤
2.2¤	-·accidents¤	¤	¤
2.3¤	-·technical·aid¤	¤	¤
2.4¤	-·medical·aid¤	¤	¤
2.5¤	-·false·calls,·total¤	¤	¤
2.5.1¤	-·false·calls,·only·fire·calls¤	¤	¤
2.5.2¤	-·false·calls,·other·calls¤	¤	¤
2.6¤	-·other¤	¤	¤
3¤	**Total·number·of·fires:¤**	**¤**	**¤**
3.1¤	-structure·(without·chimneys)¤	¤	¤
3.2¤	-in·chimneys¤	¤	¤
3.3¤	-out·of·buildings¤	¤	¤
3.4¤	-vehicle¤	¤	¤
3.5¤	-forest¤	¤	¤
3.6¤	-grass¤	¤	¤
3.7¤	-rubbish¤	¤	¤
3.8¤	-other·fires¤	¤	¤

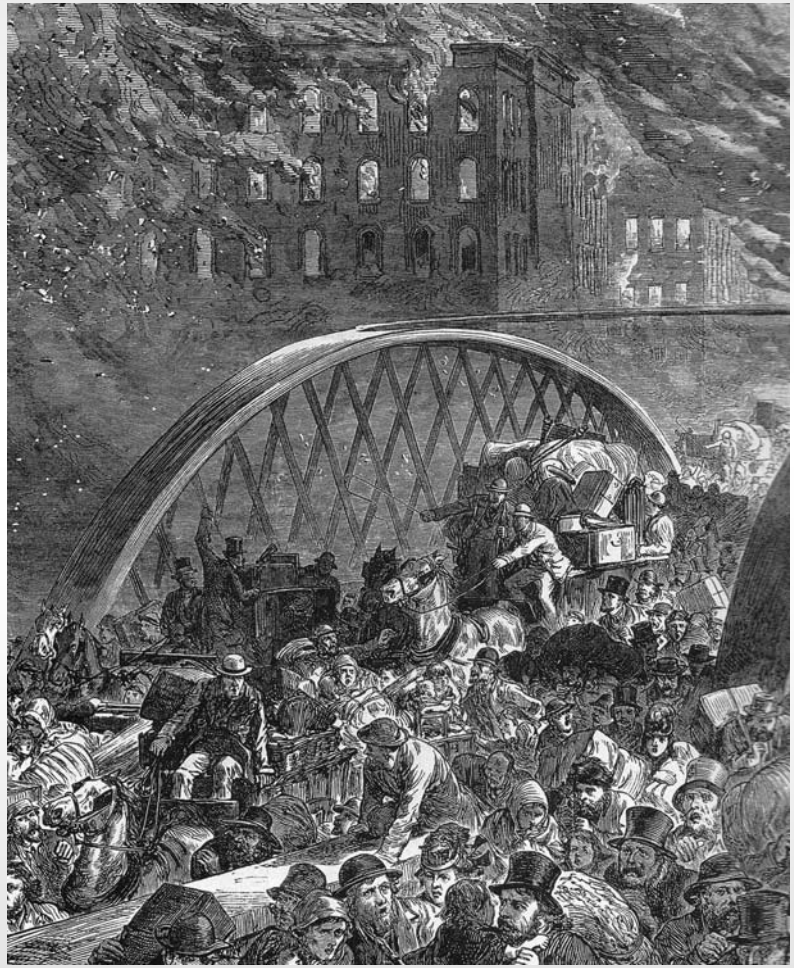
Dr. Ing. Peter Wagner 2006

Data recording per questionnaire

№	Statistical data	Country	Capital
8	**Number of civilian injuries by fire calls:**		
9	**Number of firefighters injuries by fire calls:**		
9.1	-- professionals (full time)		
9.2	-- part time		
9.3	-- volunteers		
10	**Number of firefighters:**		
10.1	-- professionals (full time)		
10.2	-- part time		
10.3	-- volunteers, total		
10.3.1	-- volunteers, only active members		
10.3.2	-- volunteers, only honor members		
11	**Number of fire stations, total:**		
11.1	-- professionals (full time)		
11.2	-- part time		
11.3	-- volunteers		
12	**Number of fire vehicles, total**		
12.1	-- pumper		
12.2	-- ambulance		
12.3	-- aerial ladders/elevators		
13	**Number of safety helmets, total**		
13.1	-- professionals (full time)		
13.2	-- part time		
13.3	-- volunteers		
14	**Compressed air breathing apparatuses, total**		
14.1	-- professionals (full time)		
14.2	-- part time		
14.3	-- volunteers		

Problems of Fire Safety in the World at the end of the 20th century

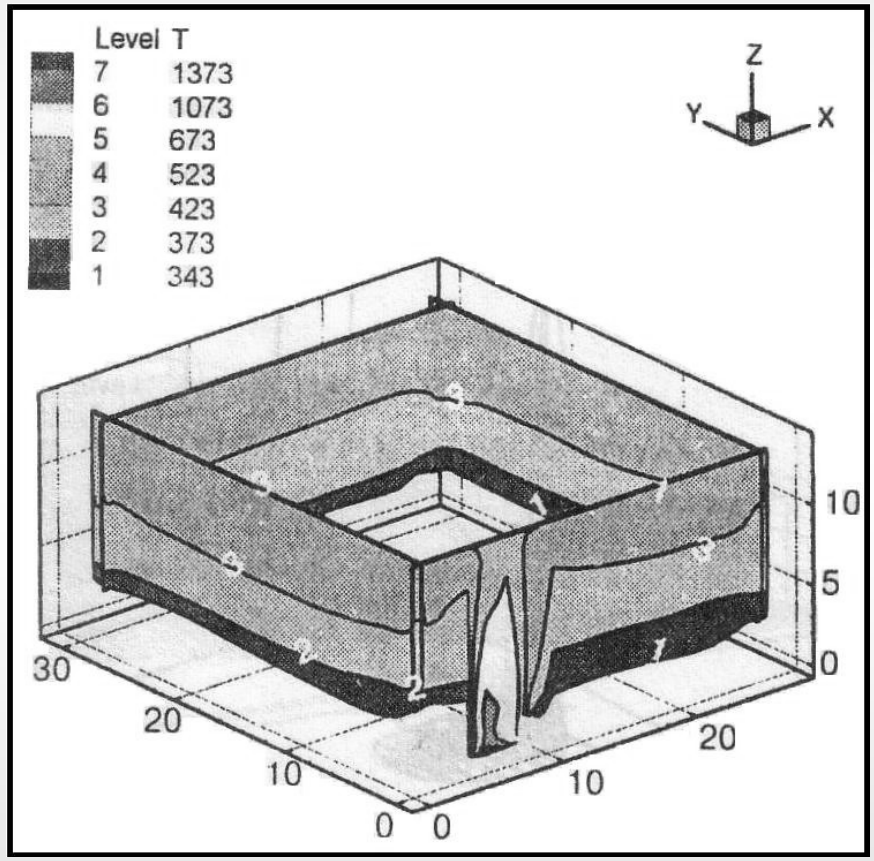
- History of fire-fighting
- The situation with fires worldwide at the end of the 20th century
- The fire statistics at the end of the 20th century
- Statistics of fire brigades worldwide and organization structures to support them



Dr. Ing. Peter Wagner 2006

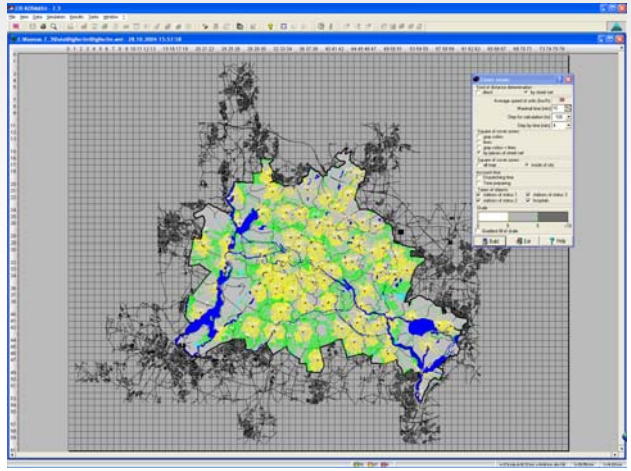
Problems of Fire Safety in the World at the end of the 20th century

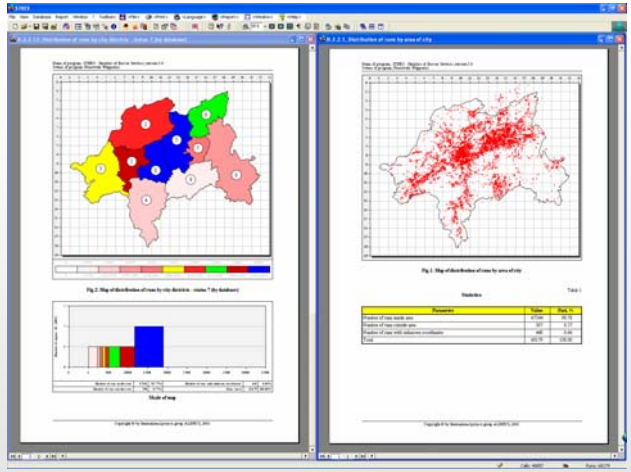
- Scientific- technical problems of fire protection around the world
- Formation of the theoretical basis of ensuring fire safety
- Fire modelling



Problems of Fire Safety in the World at the end of the 20th century

- Modelling of the fire and rescue services operations
- Problems of fire statistics in fire brigades all over the world

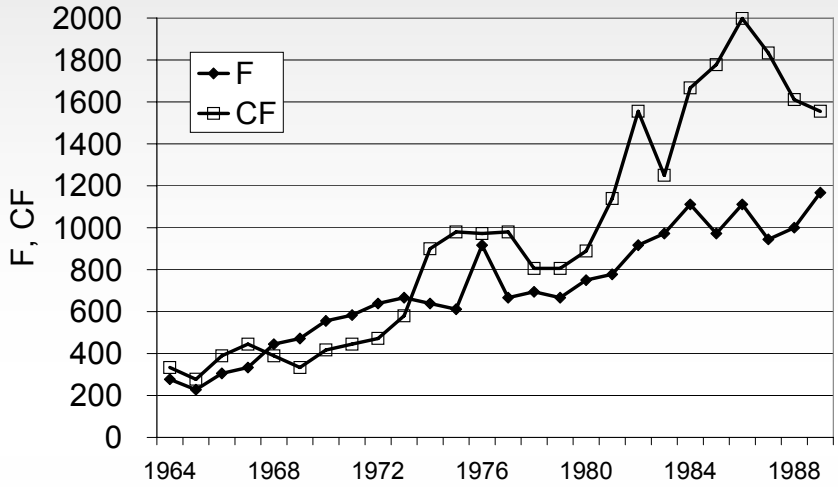




Dr. Ing. Peter Wagner 2006

Problems of Fire Safety in the World at the end of the 20th century

- Engineering problems of ensuring fire safety
- Social, economic and ecological problems of ensuring fire safety
- Fire risks
- Reconstruction and forecast of the fire situation
- The world system of fire safety

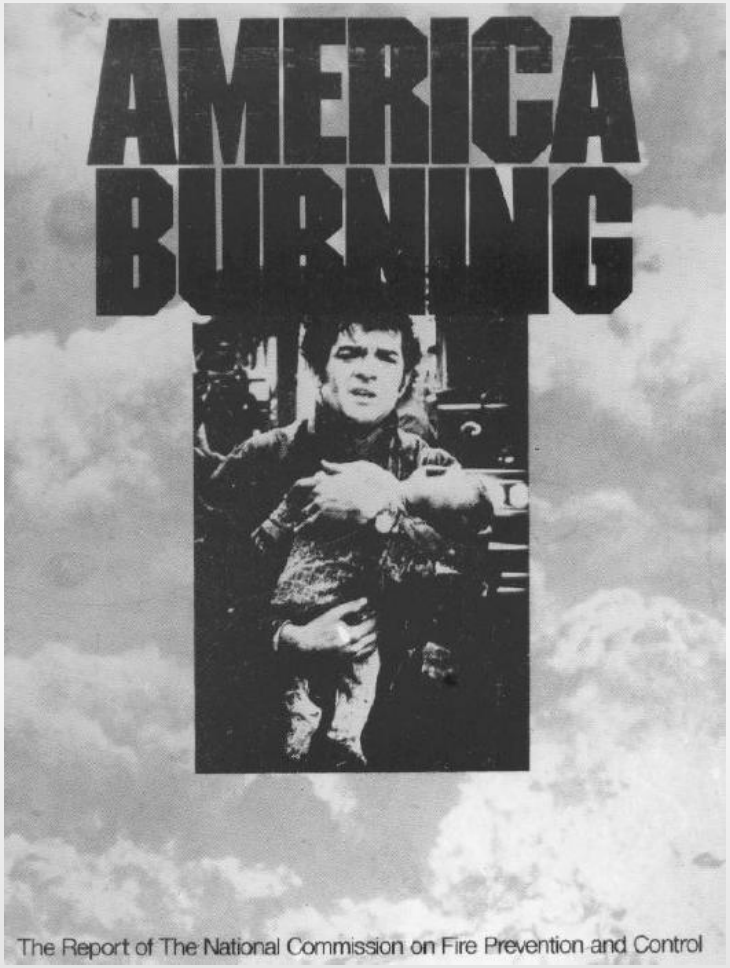


F – Number of arson fires in companies
CF – Number of company bankruptcies

Coherence between arson fires in companies and company bankruptcies in the federal state Hessians (Germany, 1964-1989)

Dr. Ing. Peter Wagner 2006

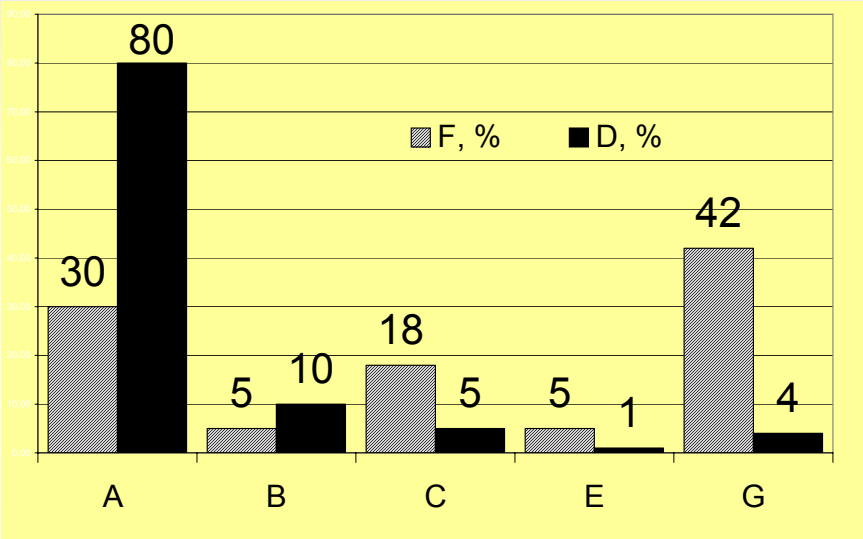
Fire risks – National Reports



- About the fire situation in the USA – Report "***America Burning***" (1973)
- About the fire situation in the Russia – Report "***Russia Burning***" (1990)
- … and what nationwide report is present in your EU country?

Dr. Ing. Peter Wagner 2006

Why we need statistics for Fire Risks?



Distribution of fires (F, %) and fire deaths (D, %) by objects of fires

- **A** – Dwelling / жилье / Wohnbereich
- **B** – Other buildings / другие здания / andere Gebäude
- **C** – Transportation / транспорт / Transport (Verkehr)
- **D** – Fire deaths / погибщих/ Brandtote
- **E** – Forest / леса / Wald
- **F** – Fires / пожары / Brände
- **G** – Others / прочие / Sonstige

Dr. Ing. Peter Wagner 2006

Fire risks by country - Russia

	Russia / Россия / Russland				
Year/год/Jahr	1995	1997	2000	2001	2002
$R_1\left[\frac{F}{10^3 E}\right]$	2,0	1,8	1,7	1,7	1,8
$R_1^B\left[\frac{F^B}{10^3 E}\right]$	1,4	1,3	1,2	1,2	1,3
$R_2\left[\frac{D}{10^2 F}\right]$	5,1	5,1	6,6	7,4	7,7
$R_2^B\left[\frac{D^B}{10^2 F^B}\right]$	6,4	6,3	8,2	9,1	9,5
$R_3\left[\frac{D}{10^5 E}\right]$	10,0	9,3	11,2	12,4	13,7
$R_3^B\left[\frac{D^B}{10^5 E}\right]$	8,8	8,3	10,1	11,3	12,4
$R_4\left[\frac{S}{E}\right]$ ($)	1,3	1,8	0,4	0,6	0,8

R_1 - Fires on 1.000 inhabitants;
R_{1B} - Fires in dwelling on 1.000 inhabitants;
R_2 - Fire deaths or fire deaths in dwelling fires on 100 fires;
R_{2B} - Fire deaths dwelling fires on 100 fires;
R_3 - Fire deaths on 100.000 inhabitants;
R_{3B} - Fire deaths in dwelling fires on 100.000 inhabitants;
R_4 - Direct fire damage per inhabitants.

Dr. Ing. Peter Wagner 2006

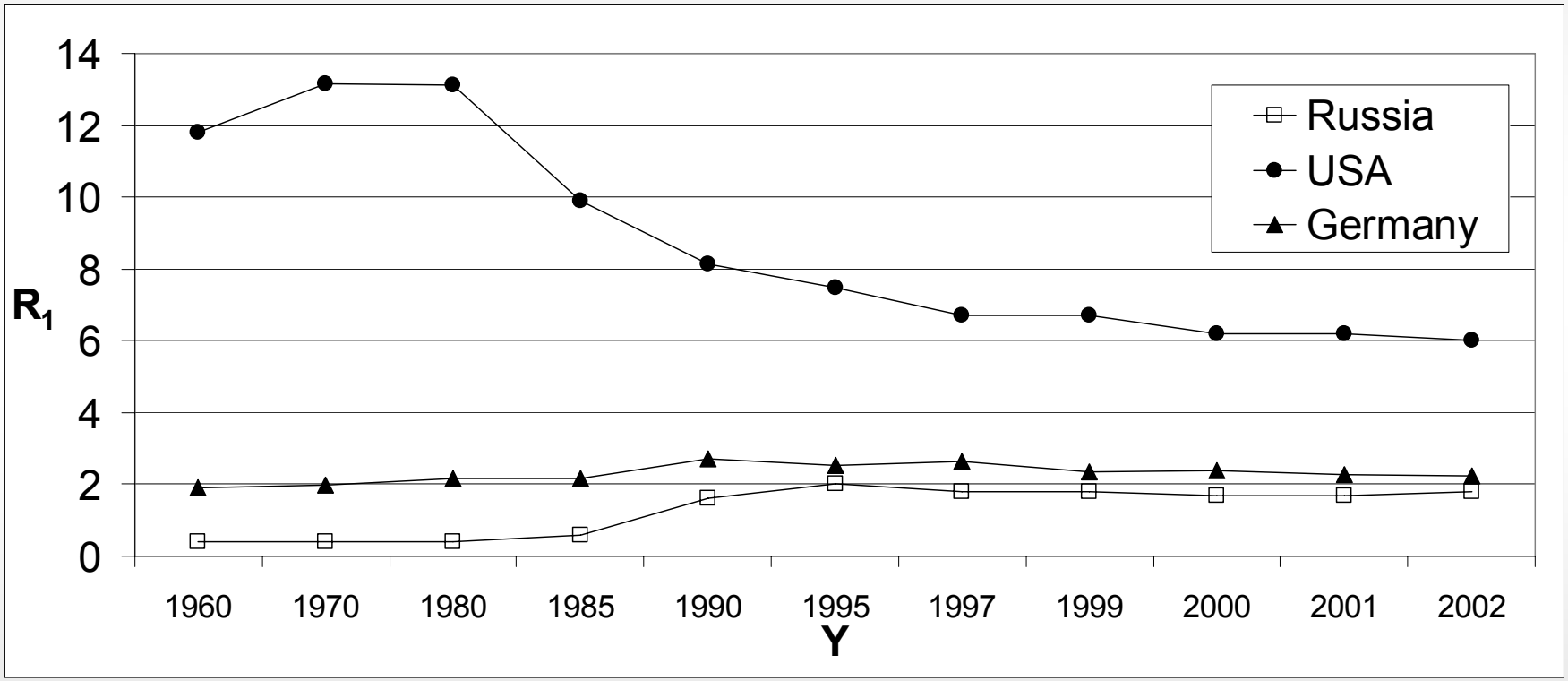
Fire risks by country - USA

¤	USA¤				
Year/год/Jahr¤	1960¤	1970¤	1980¤	1990¤	2000¤
$R_1\left[\frac{F}{10^3 E}\right]$¤	11,8¤	13,2¤	13,1¤	8,1¤	6,2¤
$R_1^B\left[\frac{F^B}{10^3 E}\right]$¤	2,8¤	3,2¤	3,2¤	1,8¤	1,4¤
$R_2\left[\frac{D}{10^2 F}\right]$¤	0,5¤	0,4¤	0,2¤	0,3¤	0,2¤
$R_2^B\left[\frac{D^B}{10^2 F^B}\right]$¤	1,8¤	1,5¤	0,7¤	0,9¤	0,9¤
$R_3\left[\frac{D}{10^5 E}\right]$¤	6,3¤	5,9¤	2,9¤	2,1¤	1,5¤
$R_3^B\left[\frac{D^B}{10^5 E}\right]$¤	5,2¤	4,7¤	2,3¤	1,7¤	1,2¤
$R_4\left[\frac{S}{E}\right]$·(\$)¤	-·¤	-¤	-¤	-¤	40,9¤

R_1 - Fires on 1.000 inhabitants;
R_{1B} - Fires in dwelling on 1.000 inhabitants;
R_2 - Fire deaths or fire deaths in dwelling fires on 100 fires;
R_{2B} - Fire deaths dwelling fires on 100 fires;
R_3 - Fire deaths on 100.000 inhabitants;
R_{3B} - Fire deaths in dwelling fires on 100.000 inhabitants;
R_4 - Direct fire damage per inhabitants.

Dr. Ing. Peter Wagner 2006

Risk R_1 "*Fires on 1.000 inhabitants*" in USSR/Russia, USA and Germany for 1960-2002



Development of fire risks R_1, R_2 and R_3 in 70 cities of the world (average meaning 1996-2002) – examples …

C	E	F	D	$R_1\left[\frac{F}{10^3 E}\right]$	$R_2\left[\frac{D}{10^2 F}\right]$	$R_3\left[\frac{D}{10^5 E}\right]$
Sao Paulo	16,00	8,385	0,037	0,5	0,4	0,2
Delhi	14,37	12,715	0,293	0,9	2,3	2,0
Tokyo	12,02	6,883	0,137	0,6	2,0	1,1
Moscow	10,40	16,722	0,388	1,6	2,3	3,7
Seoul	10,33	7,301	0,085	0,7	1,2	0,8
Teheran	8,00	10,659	0,040	1,3	0,4	0,5
Jakarta	7,58	0,874	0,040	0,1	4,6	0,5
New-York	7,00	59,753	0,163	8,5	0,3	2,3
London	7,00	49,196	0,083	7,0	0,2	1,2
Hong Kong	6,90	11,394	0,027	1,7	0,2	0,4
Paris	6,19	19,036	0,047	3,1	0,2	0,8
Bangkok	5,66	2,020	0,022	0,4	1,1	0,4
Damascus	5,50	1,923	0,039	0,3	2,0	0,7
Hochimin	5,29	0,198	0,014	0,0	7,1	0,3
St. Peterburg	4,90	9,882	0,294	2,0	3,0	6,0
Singapore	4,50	5,633	0,006	1,3	0,1	0,1
Sydney	4,00	30,000	0,000	7,5	0,0	0,0
Rome	3,77	11,760	0,000	3,1	0,0	0,0

Reconstruction and forecast of the fire situation – example for Russia

Year Год Jahr	$R_1\left[\frac{F}{10^3 E}\right]$	$R_3\left[\frac{D}{10^5 E}\right]$
1993	2,2	9,2
1994	2,1	10,5
1995	2,1	10,5
1996	2	10,7
1997	1,8	9,3
1998	1,8	9,3
1999	1,8	10,1
Ø	2	9,9

Year Год Jahr	E	V	$R_1\left[\frac{F}{10^3 E}\right]$	$R_3\left[\frac{D}{10^5 E}\right]$
2000	145,5		1,8 - 2,0	9,5 - 10,1
2005	144,0	1.	1,6 - 1,8	9,0 - 9,5
	141,2	2.	1,6 - 1,8	9,0 - 9,5
2010	141,9	1.	1,6 - 1,8	8,5 - 9,5
	138,7	2.	1,6 - 1,8	8,5 - 9,5
	136,0	3.	1,5 - 1,7	8,5 - 9,5

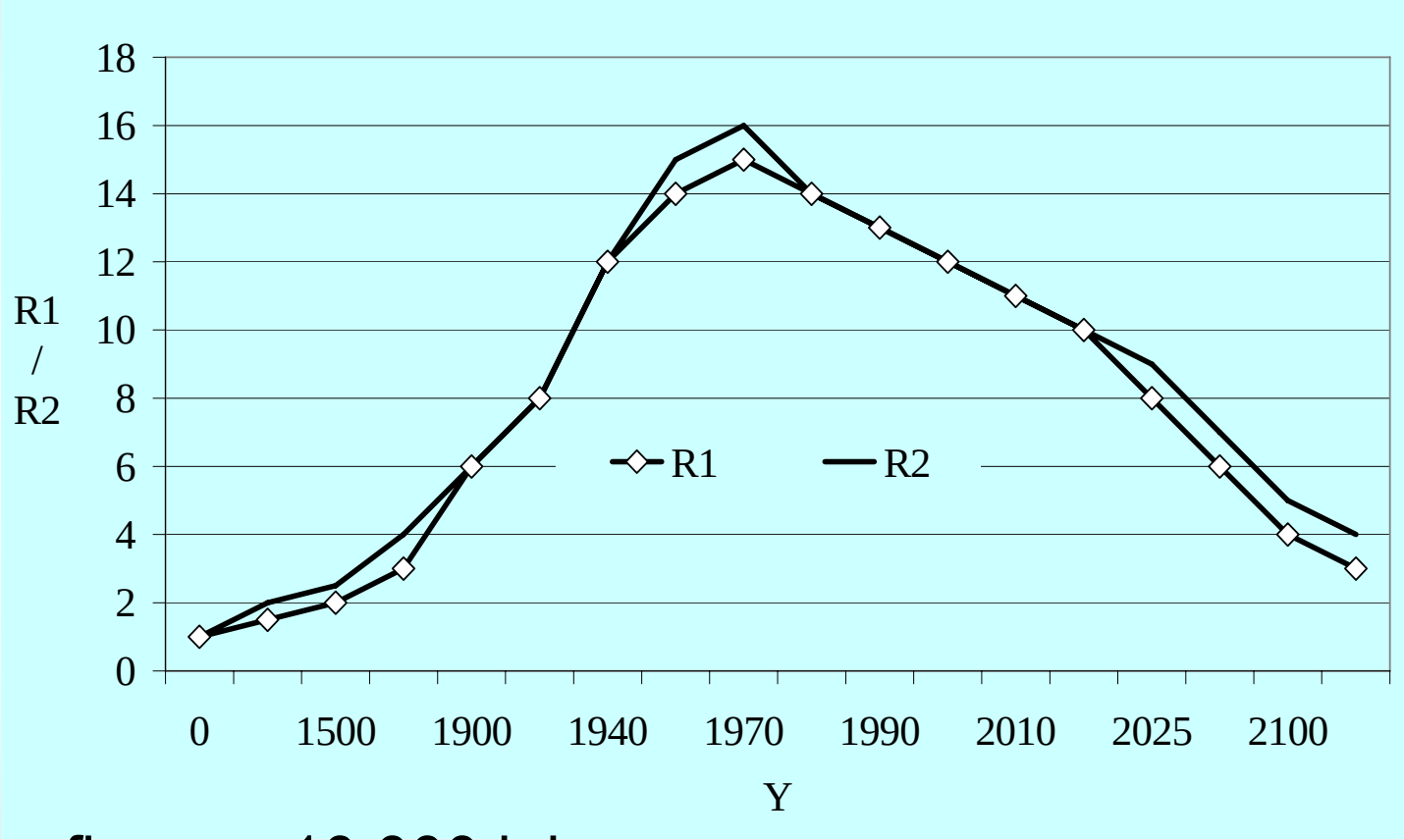
Dr. Ing. Peter Wagner 2006

Reconstruction and forecast of the number of Fires and Fire deaths in the world from year 0 to 2200

Year	Population	Number of Fires	Number of Fire Deaths
0	200	20	0,2
1000	300	45	0,6
1500	500	100	1,3
1800	900	270	3,6
1900	1650	1000	9,9
1920	1800	1450	14,5
1940	2300	2800	28,0
1960	3000	4200	45,0
1970	3700	5500	60,0
1980	4450	6200	62,5
1990	5300	6900	70,0
2000	6150	7400	74,0
2025	8500	8500	85,0
2050	10000	8000	90,0
2075	10840	6500	76,0
2100	11200	4450	56,0
2200	12000	3600	48,0

Dr. Ing. Peter Wagner 2006

Reconstruction and forecast of fire risks in the world from year 0 to 2200



- R_1 - fires on 10.000 inh.
- R_2 - fire deaths on 1.000.000 inh.

Why do we require better statistics?

- Without facts, the opinion of the fire brigade doesn't have any weight at discussions,
- Unfavorable demographic developments in many states,
- Be lacking at money in the administration
- Structure changes from the economy
- Change of the fire risks and other risks for emergency services

Dr. Ing. Peter Wagner 2006

- Complete data rise,
- Formation of relative data codes
- Calculation of fire risks
- Prognoses work out

- **What can EU do for stronger CTIF-Statistics?**

Dr. Ing. Peter Wagner 2006

What to do for stronger EU and CTIF-Statistics?

- Every member state of EU – please send your statistical data to the CFS of CTIF!
- Every member state of EU – please tell the CFS – how many copies of CTIF-reports you need?
- Every member state of EU – is it ok for you, that every 5 years CFS published a printed report and the yearly report will be at the Internet?
- What do you think about financing the work of CFS?
- Are you ready to work more intensive in fire statistics with the CFS?

Declaration

of intent about the initiative of a joint European project of CTIF, FEU and vfdb on:

"To bring about the standard fire statistics of the Member States of the European Union"

Dr. Ing. Peter Wagner 2006

Declaration

- The draft idea and its content shall be on the agenda of the CTIF delegates meeting in Varazdin, Croatia, July 20 and 21, 2005.
- This declaration was signed for examination and approval by

Walter Egger	Ruud Jonkman	Hans-Jochen Blätte
President of CTIF	General Secretary of FEU	President of vfdb

Peter Wagner and Sergei V. Sokolov

Centre of Fire Statistics of CTIF

If you will win the battle, don‘t react be active!