Fédération Aéronautique Internationale (FAI)
International Skydiving Commission (ISC)

2019 ISC SAFETY SURVEY REPORT

2019 – 33rd Year of IPC/ISC Safety Reports

CONTENTS

1 INTRODUCTION

The Safety Report for 2019 marks the 33rd year for which an IPC/ ISC Safety Report has been published.
The response rate is similar to previous years. The number of countries reporting was 46 countries (56% of 82), the highest number ever since 1988 when the survey started. The mix of responding countries is slightly different, see 1 and 2 below.

This response rate has remained more-or-less constant over the 33 years of the Safety Survey. It is regrettable that the response rate has not increased more over the years, as people became more familiar with the reporting system, and for ease of response the report form has remained the same over many years.
The countries which responded for 2019 are noted in Table 12, page 17, and responding countries for other years can also be seen in that table.

1. **Five countries** which did not supply data for 2018 did so for 2019 – **Brazil, Chile, Cuba, Paraguay and Poland**
   One country which reported for 2018 did not do so for 2019 – **Guatemala.**
   The T&S Committee and the ISC regard responses as very important and are very grateful to the 46 countries which returned figures for the 2019 survey.

2. The questionnaire, which elicited 46 responses, was sent to over 80 countries; efforts being made at various times to both obtain responses and to bring more countries into the reporting system. The response rate (46 in 82) was therefore 56%.
   The variation in responses is an important factor which renders year-to-year comparison of figures invalid, as the mix of respondents differs from year to year (*see 1 above*). It is also regrettable that so many countries do not take part in this annual survey.

1.1 Aims

The aims of the survey were:
1. To collect information on the number of fatalities in skydiving worldwide in 2019.
2. To establish reliable and valid figures for skydiving risks during 2019.
3. To establish reliable and valid key figures for worldwide skydiving activity in 2019.
4. To establish reliable and valid risk figures based on statistics from four countries over a period of 57 years. (*see 3.2, page 6*)

2 METHODS

2.1 Information collection, preparation and distribution of the report

The method used to collect the data is the same as in previous years.
This work was organised by the Technical & Safety Committee of the International Skydiving Commission (FAI).
The methods used to analyse figures for this report are as used in previous years.
The survey form was the same as in previous years and this is designed to allow countries, and respondents, to become familiar with the survey and with reporting. The questions on the form were the same as in previous years.

This report is produced by the Technical & Safety Committee of the International Skydiving Commission of the *Fédération Aéronautique Internationale*.

This 2019 Safety Report, with a Power Point presentation summary, has been sent by e-mail to all FAI countries in which there is a parachuting organisation and for which the Technical & Safety Committee has a contact.
The report, with the Power Point presentation and other material, was also distributed to ISC Delegates. Further copies are available, by e-mail, from the Technical & Safety Committee of ISC (e-mail: liammcnulty43@gmail.com).

2.2 Data processing methods

No changes have been made to data submitted; the figures being exactly as they have been returned by responding countries.

2.3 Survey Problems

Similar problems were encountered with the 2019 Safety Survey as in previous years.
These problems are:

1 The relatively low response rate – 56%.

2 Most countries give estimates only, rather than exact figures.
3 Five of the 2019 respondents were new, for 2019, and one of the 2018 respondents did not report for 2019.

However, it should be noted that most of the countries with large numbers of skydivers and skydives did respond to the 2019 Safety Survey.
Notwithstanding the problems encountered with a survey of this kind, the survey results are of value, when used with caution, and bearing the limitations in mind.
Thanks are extended to the people who collected and forwarded the data.
The Technical & Safety Committee of ISC will continue to try to get more countries to take part in this Safety Survey.

3 RESULTS

The report results are based on two sources of information:-

1 **Total of respondents – 46 countries.**
2 **Key figure information over a period of 57 years in the four countries – Finland, France, Norway and Sweden.**

Where any discrepancies arise it is because data is taken from the report sheets exactly as it is returned. No attempt is made to change or 'correct' figures.

3.1 Total

3.1.1 Skydiving Safety Figures 2019

Table 1, 2019

	Numbers		Number of fatalities				Leading causes of fatalities							
46 Countries	*jumpers*	*jumps*	*total*	*stud.*	*interm.*	*exp.*	*cutaway no res.*	*low cutaway*	*no/low main act.*	*f/fall collision*	*intent fast land*	*other landing*	*tandem fatalities*	*other causes*
Solo	171,337	5,523,452	44	8	5	31	0	5	0	2	6	10	4	17
Tandem	1,363,201	1,363,201												
GRAND TOTALS	1,534,538	6,886,653												

The survey response indicates that in 2019, 6.89 million jumps were made by 1.53 million jumpers in the 46 countries which supplied data for the survey.
Note: – These total figures **INCLUDE TANDEMS** (*see table 1 above*)
Data on Tandem jumps is on page 12

3.1.2 Primary Skydiving Figures 1989 – 2019

Table 2, 2019

Year & No. countries	Number Jumpers	Number Jumps	Number Fatalities	Jumps per Jumper	Jumps per Fatality	Jumpers per Fatality
1989 - 34 countries	340715	5564137	97	16	57362	3513
1990 - 32 countries	316994	5189991	70	16	74143	4528
1991 - 35 countries	245162	4848025	74	20	65514	3313
1992 - 35 countries	300586	4591980	59	15	77830	5095
1993 - 38 countries	370679	5267754	101	14	52156	3670
1994 - 40 countries	285253	5064125	70	18	72345	4075
1995 - 38 countries	322322	5562691	64	17	86917	5036
1996 - 40 countries	323300	6013691	76	19	79128	4254
1997 - 37 countries	404198	6843299	78	17	87735	5182
1998 - 33 countries	332603	5596753	72	17	77733	4619
1999 - 26 countries	335867	5594191	60	17	93237	5598
2000 - 27 countries	355405	5750464	63	16	91277	5641
2001 - 31 countries	417202	6872438	92	16	74700	4535
2002 - 33 countries	357155	5769010	73	16	79028	4893
2003 - 39 countries	402513	6335624	82	16	77264	4909
2004 - 39 countries	493250	5332756	53	11	100618	9307
2005 - 36 countries	806515	6147351	64	8	96052	12602
2006 - 39 countries	832683	5958194	51	7	116827	16327
2007 - 41 countries	837831	6222629	68	7	91509	12321
2008 - 44 countries	918436	5770169	70	6	82431	13121
2009 - 40 countries	955558	5452521	62	6	87944	15412
2010 - 40 countries	1164200	6420087	66	6	97274	17639
2011 - 36 countries	1122022	6079723	52	5	116918	21577
2012 - 37 countries	1059937	5230563	53	5	98690	19999
2013 - 39 countries	1381239	6805975	57	5	119403	24232
2014 - 37 countries	1314867	6237725	31	5	201217	42415
2015 - 37 countriies	1325838	6627023	60	5	110450	22097
2016 - 40 countries	1375159	7523610	39	5	192913	35260
2017 - 36 countries	1418443	6675733	51	5	130897	27813
2018 - 42 countries	1527205	6364651	44	4	144651	34709
2019 - 46 countries	1534538	6886653	44	4	156515	34876

Table 2, 2019 - shows the following –

Risk Factor 1 - Jumps per one fatality for 46 countries which provided data for 2019 – 156,515

Risk Factor 2 - Jumpers per one fatality for 46 countries which provided data for 2019 – 34,876

These Risk Factors are inclusive of Tandems as they are overall figures for jumping.

It is not valid to make direct comparisons year-to-year, because of the differences in the numbers of respondents and in the mix of responding countries.
The inclusion of Tandem data in more recent years has dramatically influenced these figures.
Earlier figures are given for general information.

3.1.3 Fatalities in Subgroups

Category	*Number of Fatalities*	*% of Fatalities*
Students	**8**	**18%**
Intermediate	**5**	**11%**
Expert	**31**	**70%**
TOTAL	**44**	**99%**

Distribution of fatalities in 2019, in numbers and percentages in each category, also showing figures for the years 1990 to 2018 inclusive are shown in *Table 3, 2019,* page 5.

Table 3, 2019

FATALITIES	1990	%	1991	%	1992	%	1993	%	1994	%	1995	%	1996	%	1997	%	1998	%	1999	%	2000	%	2001	%	2002	%
Student	24	34	27	38	23	39	29	29	19	27	12	19	13	17	22	28	16	22	16	27	19	30	27	29	15	21
Intermediate	23	33	20	28	21	36	30	30	27	39	24	37	20	26	20	26	4	6	15	25	15	24	23	25	14	19
Expert	23	33	25	35	15	25	42	41	24	34	28	44	43	57	36	46	52	72	29	48	29	46	42	46	44	60
TOTAL	70	100	72	101	59	100	101	100	70	100	64	100	76	100	78	100	72	100	60	100	63	100	92	100	73	100

FATALITIES	2003	%	2004	%	2005	%	2006	%	2007	%	2008	%	2009	%	2010	%	2011	%	2012	%	2013	%	2014	%	2015	%
Student	14	17	8	15	15	23	11	22	16	24	18	26	12	19	10	15	10	19	11	20	9	16	3	10	11	18
Intermediate	28	34	11	21	19	30	9	18	16	24	13	19	14	23	9	14	7	13	11	20	10	18	7	23	11	18
Expert	40	49	34	64	30	47	31	60	36	53	39	56	36	58	47	71	35	67	31	60	38	67	21	68	38	63
TOTAL	82	100	53	100	64	100	51	100	68	101	70	101	62	100	66	100	52	99	53	100	57	101	31	101	60	99

FATALITIES	2016	%	2017	%	2018	%	2019	%
Student	5	13	10	20	4	9	8	18
Intermediate	7	18	6	12	13	30	5	11
Expert	27	69	35	68	27	61	31	70
TOTAL	39	100	51	100	44	100	44	99

CAUSES	1990	%	1991	%	1992	%	1993	%	1994	%	1995	%	1996	%	1997	%	1998	%	1999	%	2000	%	2001	%	2002	%
Cut-away, no res.	11	14	12	16	12	20	9	9	15	21	11	17	4	5	5	6	1	1	2	3	3	5	3	3	2	3
Cut-away, low res.	20	30	15	20	3	5	12	12	1	1	15	23	12	16	14	18	2	3	7	12	5	8	13	14	4	5
No/low main pull	12	17	18	24	11	19	20	20	13	19	16	25	13	17	18	23	14	19	9	15	7	11	12	13	12	16
Other	27	39	29	39	33	56	60	59	41	59	22	34	47	62	41	53	55	76	42	70	48	76	64	70	55	75
TOTAL	70	100	74	99	59	100	101	100	70	100	64	99	76	100	78	100	72	99	60	100	63	100	92	100	73	99

CAUSES	2003	%	2004	%	2005	%	2006	%	2007	%	2008	%	2009	%	2010	%	2011	%	2012	%	2013	%	2014	%	2015	%
Cut-away, no res.	5	6	0	0	4	6	1	2	7	10	3	4	2	3	1	1.5	0	0	2	4	2	3.5	2	6	3	5
Cut-away, low res.	11	13	3	6	10	16	4	8	4	6	4	6	2	3	5	8	1	2	5	9.5	11	19	2	6	4	7
No/low main pull	11	13	3	6	6	9	9	18	5	7	5	7	7	11	9	13.5	7	13	5	9.5	6	10.5	2	6	3	5
Other	55	67	47	87	44	69	37	72	52	76	58	83	51	82	51	77	44	85	41	77	38	67	25	81	50	83
TOTAL	82	99	53	99	64	100	51	100	68	99	70	100	62	99	66	100	52	100	53	100	57	100	31	99	60	100

CAUSES	2016	%	2017	%	2018	%	2019	%
Cut-away, no res.	2	5	1	2	1	2	0	0
Cut-away, low res.	0	0	4	8	4	9	5	11
No/low main pull	1	2.5	4	8	2	5	0	0
Other	36	92.5	42	82	37	84	39	89
TOTAL	39	100	51	100	44	100	44	100

Distribution of 'Other' Fatalities

Table 4, 2019

Other Fatalities	*Number*	*% of 39*
Other Landing Errors	10	26%
Intentional Fast Landings	6	15%
Tandem Fatalities	4	10%
Hard Openings	3	8%
Canopy Collision	3	8%
Freefall Collision	2	5%
Main entanglement with body, cutaway and reserve entangled with main	2	5%
Drowning	2	5%
Premature deployment in aircraft door	1	2.6%
Severe opening and twists to landing	1	2.6%
Medical	1	2.6%
Landed spinning main, no cutaway	1	2.6%
Assumed main activation, but no cutaway or reserve deployment	1	2.6%
Unstable cutaway, reserve bridle entangled in arm, insufficient drag to deploy reserve	1	2.6%
Spinning under reserve	1	2.6%
TOTAL	39	100%

Three largest groupings into which 2019 fatalities fall (all 46 countries – all 44 fatalities)

1 Largest category - 10 (26% of 44) Other Landing Errors
2 Second-largest categories - 6 (15% of 44) Intentional Fast Landings
3 Third-largest categories - 5 (11% of 44) Cutaway and no Reserve Deployment

Fatalities with jumper still having serviceable equipment; all 46 countries, 44 fatalities.

1 It appears that 35 (80%) of the 44 fatalities happened with the jumper having at least one good parachute.

2 It also appears that 28 (64%) of the 44 fatalities occurred after the successful deployment of the main parachute.

These figures are arrived at through scrutiny of the reported data and the discounting of some fatalities, where the circumstances are unclear, or the fatalities do not appear to fall into either of these categories 1 or 2.

3.2 A 57-Year Study from Four Countries.

This is a study of skydiving safety over a period of 57 years (1963 to 2019 inclusive), in Finland, France, Norway and Sweden.

Special importance is attached to this section of the report.
The compilation of accurate data results in validity of trends and comparisons, due to the consistency of the reporting and the accuracy of the figures.

3.2.1 The Value and Usefulness of this Study

The figures from these four countries have been used over a long period of years because they are accurate and reliable figures in numbers of jumps, of jumpers and of fatalities. This gives the opportunity to:-

1 Establish authoritative figures for fatality risks in skydiving.
2 Give skydiving countries reliable and valid figures as reference for safety work.
3 Encourage countries to establish methods of collecting exact data for monitoring the safe development of skydiving.
4 Help eliminate 'opinion' and replace it with facts and figures as a basis for debate on safety.

It is important to be able to make valid comparisons and discern trends, if and when such exist, in safety advances or dis-improvements. This is best done by long-term collection of figures from the same, reliable, sources.
As might be expected, the fatality rates, as a ratio to jumps made, are high in the early years of this study.

The advances over time in knowledge, instruction and equipment show in the marked improvement in this rate in the more recent years of the study. The earlier years' figures still affect the long-term statistics.

There are factors which affect, over the years, movements and trends in the whole area of safety and incidents in parachuting, e.g., changes in type of equipment in use, advances in equipment design and features and advancement in safety devices. When any in-depth study or comparison of any period is made, such changes and developments must be taken into account.

In addition to the 57-year figures, the last five years, 2015 to 2019 inclusive, have been taken as a separate exercise. This gives an indication of trends in more recent times in the four countries: – Finland, France, Norway and Sweden.

3.2.2 Finland 1963 – 2019

Table 5, 2019, Finland

Year	Jumps	Fatalities	Jumpers	Account Fatalities	Account Jumps	Account Jumpers	Fatality / Jumps	Fatality / Jumpers
1963	338	0	10	0	338	10	na	na
1964	1111	0	30	0	1449	40	na	na
1965	1515	0	50	0	2964	90	na	na
1966	2057	1	70	1	5021	160	5021	160
1967	3298	0	100	1	8319	260	8319	260
1968	3798	2	100	3	12117	360	4039	120
1969	5532	0	150	3	17649	510	5883	170
1970	9633	0	220	3	27282	730	9094	243
1971	13005	2	250	5	40287	980	8057	196
1972	9600	0	250	5	49887	1230	9977	246
1973	11000	2	280	7	60887	1510	8698	216
1974	10586	0	300	7	71473	1810	10210	259
1975	12235	0	460	7	83708	2270	11958	324
1976	13586	1	534	8	97294	2804	12162	351
1977	11127	0	544	8	108421	3348	13553	419
1978	14289	0	635	8	122710	3983	15339	498
1979	17896	0	741	8	140606	4724	17576	591
1980	23597	1	855	9	164203	5579	18245	620
1981	24151	0	999	9	188354	6578	20928	731
1982	25362	0	999	9	213716	7577	23746	842
1983	30126	0	1191	9	243842	8768	27094	974
1984	32438	3	1111	12	276280	9879	23023	823
1985	30100	0	1055	12	306380	10934	25532	911
1986	30734	0	1284	12	337114	12218	28093	1018
1987	33820	0	1309	12	370934	13527	30911	1127
1988	42599	0	1546	12	413533	15073	34461	1256
1989	49071	1	1784	13	462604	16857	35585	1297
1990	52586	0	2118	13	515190	18975	39630	1460
1991	53453	0	2025	13	568643	21000	43742	1615
1992	54732	0	2032	13	623375	23032	47952	1772
1993	64167	3	2000	16	687542	25032	42971	1565
1994	47998	1	2169	17	735540	27201	43267	1600
1995	49546	1	2431	18	785086	29632	43616	1646
1996	52980	0	3280	18	838066	32912	46559	1829
1997	56287	1	3100	19	894353	36012	47071	1895
1998	55030	0	2565	19	949383	38577	49968	2030
1999	57536	0	2708	19	1006919	41285	52996	2173
2000	49828	1	3100	20	1056747	44385	52837	2219
2001	49963	1	3056	21	1106710	47441	52700	2259
2002	56181	1	3043	22	1162891	50484	52859	2295
2003	45317	1	2771	23	1208208	53255	52531	2315
2004	45132	1	2521	24	1253340	55776	52223	2324
2005	44723	0	3127	24	1298063	58903	54086	2454
2006	42779	0	3254	24	1340842	62157	55868	2590
2007	37699	0	2346	24	1378541	64503	57439	2688
2008	36758	0	2402	24	1415299	66905	58971	2788
2009	46935	0	3840	24	1462234	70745	60926	2948
2010	40482	0	3535	24	1502716	74280	62613	3095
2011	45666	0	3997	24	1548382	78277	64516	3262
2012	44951	0	4486	24	1593333	82763	66389	3448
2013	52840	1	5489	25	1646173	88252	65847	3530
2014	42261	1	4548	26	1688434	92800	64940	3569
2015	38015	1	3706	27	1726449	96506	63943	3574
2016	37468	0	3358	27	1763917	99864	65330	3699
2017	38650	0	3400	27	1802567	103264	66762	3825
2018	37897	1	3708	28	1840464	106972	65731	3820
2019	34348	0	3476	28	1874812	110448	66958	3945
TOTAL	**1874812**	**28**	**110448**				**66958**	**3945**

5 YEARS - 2015 TO 2019

Year	Jumps	Fatalities	Jumpers	Account Fatalities	Account Jumps	Account Jumpers	Fatality/ Jumps	Fatality/ Jumpers
2015	38015	1	3706	1	38015	3706	38015	3706
2016	37468	0	3358	1	75483	7064	75483	7064
2017	38650	0	3400	1	114133	10464	114133	10464
2018	37897	1	3708	2	152030	14172	76015	7086
2019	34348	0	3476	2	186378	17648	93189	8824
TOTAL	**186378**	**2**	**17648**	**2**			**93189**	**8824**

In Finland the transition from round to ram-air canopies began to occur on a larger scale in 1975.
All experienced jumpers were using ram-air main canopies in 1980.
The transition to ram-air student canopies took place from 1986 to 1988.

Risk Factors	1963 – 2019	2015 – 2019
Risk Factor 1 (fatality - jumps)	1: 66,958	1: 93,189
Risk Factor 2 (fatality - jumpers)	1: 3,945	1: 8,824

3.2.3 France 1963 – 2019

Table 6, 2019, France

Year	Jumps	Fatalities	Jumpers	Account Fatalities	Account Jumps	Account Jumpers	Fatality /Jumps	Fatality /Jumpers
1963	79041	2	2140	2	79041	2140	39521	1070
1964	103005	2	2732	4	182046	4872	45512	1218
1965	109452	2	3694	6	291498	8566	48583	1428
1966	122465	1	5790	7	413963	14356	59138	2051
1967	156248	4	6964	11	570211	21320	51837	1938
1968	179861	2	7468	13	750072	28788	57698	2214
1969	204716	2	7447	15	954788	36235	63653	2416
1970	185124	2	6648	17	1139912	42883	67054	2523
1971	195073	3	7291	20	1334985	50174	66749	2509
1972	132415	5	6982	25	1467400	57156	58696	2286
1973	228660	4	7982	29	1696060	65138	58485	2246
1974	225426	2	7915	31	1921486	73053	61983	2357
1975	286467	6	8622	37	2207953	81675	59674	2207
1976	286453	3	8770	40	2494406	90445	62360	2261
1977	262893	8	9501	48	2757299	99946	57444	2082
1978	267861	8	9689	56	3025160	109635	54021	1958
1979	264280	13	10193	69	3289440	119828	47673	1737
1980	243246	7	9531	76	3532686	129359	46483	1702
1981	284848	6	10191	82	3817534	139550	46555	1702
1982	320453	5	10598	87	4137987	150148	47563	1726
1983	348268	10	18143	97	4486255	168291	46250	1735
1984	379784	13	21772	110	4866039	190063	44237	1728
1985	394213	10	20501	120	5260252	210564	43835	1755
1986	394837	7	20946	127	5655089	231510	44528	1823
1987	397250	6	21006	133	6052339	252516	45506	1899
1988	419229	8	25640	141	6471568	278156	45898	1973
1989	475601	13	30201	154	6947169	308357	45111	2002
1990	496287	4	28132	158	7443456	336489	47110	2130
1991	473460	9	25284	167	7916916	361773	47407	2166
1992	486617	7	25360	174	8403533	387133	48296	2225
1993	472777	5	30143	179	8876310	417276	49588	2331
1994	482352	8	21000	187	9358662	438276	50046	2344
1995	519571	6	21258	193	9878233	459534	51183	2381
1996	490065	7	25768	200	10368298	485302	51841	2427
1997	536872	8	28552	208	10905170	513854	52429	2470
1998	520661	7	31095	215	11425831	544949	53143	2535
1999	547853	9	32325	224	11973684	577274	53320	2577
2000	481812	6	33281	230	12455496	610555	54154	2655
2001	558257	2	35964	232	13013753	646519	56094	2787
2002	595675	8	39246	240	13609428	685765	56706	2857
2003	649793	10	42362	250	14259221	728127	57037	2913
2004	602976	6	49497	256	14862197	777624	58055	3038
2005	627291	4	46804	260	15489488	824428	59575	3171
2006	620914	5	44329	265	16110402	868757	60794	3278
2007	629363	2	46911	267	16739765	915668	62696	3429
2008	588079	7	29904	274	17327844	945572	63240	3451
2009	618940	2	29859	276	17946784	975431	65025	3534
2010	590158	5	38910	281	18536942	1014341	65968	3610
2011	633831	2	41084	283	19170773	1055425	67741	3729
2012	634225	3	53581	286	19804998	1109006	69248	3878
2013	616121	8	93843	294	20421119	1202849	69460	4091
2014	648933	0	99972	294	21070052	1302821	71667	4431
2015	578810	7	98535	301	21648862	1401356	71923	4656
2016	598844	0	103180	301	22247706	1504536	73913	4998
2017	598900	0	103200	301	22846606	1607736	75902	5341
2018	679926	2	122566	303	23526532	1730302	77645	5711
2019	591210	3	63000	306	24117742	1793302	78816	5860
TOTAL	**24117742**	**306**	**1793302**				**78816**	**5860**

5 YEARS - 2015TO 2019

Year	Jumps	Fatalities	Jumpers	Account Fatalities	Account Jumps	Account Jumpers	Fatality/ Jumps	Fatality/ Jumpers
2015	578810	7	98535	7	578810	98535	82687	14076
2016	598844	0	103180	7	1177654	201715	168236	28816
2017	598900	0	103200	7	1776554	304915	253793	43559
2018	679926	2	122566	9	2456480	427481	272942	47498
2019	591210	3	63000	12	3047690	490481	253974	40873
TOTAL	**3047690**	**12**	**490481**				**253974**	**40873**

Risk Factors	**1963 – 2019**	**2015 - 2019**
Risk Factor 1 (fatality - jumps)	**1: 78,816**	**1: 253,974**
Risk Factor 2 (fatality - jumpers	**1: 5,860**	**1: 40,873**

3.2.4 Norway 1963 – 2019

Table 7, 2019, Norway

Year	Jumps	Fatalities	Jumpers	Account Fatalities	Account Jumps	Account Jumpers	Fatality /Jumps	Fatality /Jumpers
1963	0	0	0	0	0	0	na	na
1964	198	0	149	0	198	149	na	na
1965	813	0	200	0	1011	349	na	na
1966	1235	0	256	0	2246	605	na	na
1967	895	0	277	0	3141	882	na	na
1968	998	0	245	0	4139	1127	na	na
1969	2032	1	383	1	6171	1510	6171	1510
1970	3823	0	386	1	9994	1896	9994	1896
1971	6850	0	462	1	16844	2358	16844	2358
1972	7606	0	523	1	24450	2881	24450	2881
1973	6074	1	657	2	30524	3538	15262	1769
1974	8895	0	781	2	39419	4319	19710	2160
1975	14941	1	946	3	54360	5265	18120	1755
1976	17162	2	1088	5	71522	6353	14304	1271
1977	19898	1	1211	6	91420	7564	15237	1261
1978	18468	1	1403	7	109888	8967	15698	1281
1979	19674	0	1452	7	129562	10419	18509	1488
1980	22960	3	1645	10	152522	12064	15252	1206
1981	22090	2	1564	12	174612	13628	14551	1136
1982	23602	0	1645	12	198214	15273	16518	1273
1983	25478	0	1749	12	223692	17022	18641	1419
1984	29514	1	1965	13	253206	18987	19477	1461
1985	25159	1	2160	14	278365	21147	19883	1511
1986	38293	0	2455	14	316658	23602	22618	1686
1987	44635	2	2633	16	361293	26235	22581	1640
1988	45649	1	2754	17	406942	28989	23938	1705
1989	43939	0	2992	17	450881	31981	26522	1881
1990	44228	1	3371	18	495109	35352	27506	1964
1991	40308	0	2108	18	535417	37460	29745	2081
1992	42486	3	3522	21	577903	40982	27519	1952
1993	48876	0	3482	21	626779	44464	29989	2117
1994	40816	1	3343	22	667595	47807	30345	2173
1995	44170	0	3512	22	711765	51319	32353	2333
1996	46311	1	3849	23	758076	55168	32960	2399
1997	49545	1	1533	24	807621	56701	33651	2363
1998	46836	0	1102	24	854457	57803	35602	2408
1999	47943	1	2449	25	902400	60252	36096	2410
2000	50557	2	2120	27	952957	62372	35295	2310
2001	58203	0	1946	27	1011160	64318	37450	2382
2002	62636	2	2394	29	1073796	66712	37027	2300
2003	70436	1	2270	30	1144232	68982	38141	2299
2004	63019	1	1666	31	1207251	70648	38944	2279
2005	64552	0	3606	31	1271803	74254	41026	2395
2006	62630	0	3777	31	1334433	78031	43046	2517
2007	50698	0	3642	31	1385131	81673	44682	2635
2008	50753	0	3428	31	1435884	85101	46319	2745
2009	54654	0	4005	31	1490538	89106	48082	2874
2010	61645	0	4869	31	1552183	93975	50070	3031
2011	59929	1	5074	32	1612112	99049	50379	3095
2012	56491	2	5201	34	1668603	104250	49077	3066
2013	59311	2	4363	36	1727914	108613	47998	3017
2014	60199	0	5042	36	1788113	113655	49670	3157
2015	62820	0	5480	36	1850933	119135	51415	3309
2016	67672	1	5965	37	1918605	125100	51854	3381
2017	67324	0	5777	37	1985929	130877	53674	3537
2018	67388	1	5621	38	2053317	136498	54035	3592
2019	67559	1	5221	39	2120876	141719	54381	3634
TOTAL	**2120876**	**39**	**141719**				**54381**	**3634**

5 YEARS - 2015 TO 2019								
Year	Jumps	Fatalities	Jumpers	Account Fatalities	Account Jumps	Account Jumpers	Fatality/ Jumps	Fatality/ Jumpers
2015	62820	0	5480	0	62820	5480	0	0
2016	67672	1	5965	1	130492	11445	130492	11445
2017	67324	0	5777	1	197816	17222	197816	17222
2018	67388	1	5621	2	265204	22843	132602	11422
2019	67559	1	5221	3	332763	28064	110921	9355
TOTAL	**332763**	**3**	**28064**				**110921**	**9355**

Risk Factors	**1963 – 2019**	**2015 - 2019**
Risk Factor 1 (fatality – jumps)	**1: 54,381**	**1: 110,921**
Risk Factor 2 (fatality – jumpers)	**1: 3,634**	**1: 9,355**

3.2.5 Sweden 1963-2019

Table 8, 2019, Sweden

Year	Jumps	Fatalities	Jumpers	Account Fatalities	Account Jumps	Account Jumpers	Fatality / Jumps	Fatality / Jumpers
1963	879	0	220	0	879	220	na	na
1964	1526	0	277	0	2405	497	na	na
1965	1269	1	377	1	3674	874	3674	874
1966	2151	0	371	1	5825	1245	5825	1245
1967	2920	1	487	2	8745	1732	4373	866
1968	4629	0	639	2	13374	2371	6687	1186
1969	6587	0	849	2	19961	3230	9981	1615
1970	7268	0	907	2	27229	4127	13615	2064
1971	8307	3	1049	5	35536	5176	7101	1035
1972	10810	0	1061	5	46346	6237	9269	1248
1973	12748	2	1023	7	59094	7260	8442	1037
1974	13064	1	1010	8	72158	8270	9020	1034
1975	17675	1	1144	9	89833	9414	9981	1046
1976	20749	0	1586	9	110582	11000	12287	1222
1977	25326	3	2009	12	135908	13019	11326	1085
1978	26561	1	2150	13	162469	15149	12498	1165
1979	30954	1	2400	14	193423	17559	13816	1254
1980	31509	2	2441	16	224932	20000	14058	1250
1981	29775	2	2564	18	254707	22564	14150	1254
1982	30726	1	2137	19	285433	24701	15023	1300
1983	35698	2	2581	21	321131	27282	15292	1299
1984	43692	2	2681	23	364823	29963	15862	1303
1985	46208	0	2278	23	411031	32241	17871	1402
1986	52490	0	2849	23	463521	35090	20153	1526
1987	51327	1	2448	24	514848	37538	21452	1564
1988	57715	1	2436	25	572563	39974	22903	1599
1989	70475	1	2969	26	643038	42943	24732	1651
1990	77257	1	3258	27	720295	46201	26678	1711
1991	95415	0	3175	27	815710	49376	30211	1829
1992	103706	0	3635	27	919416	53011	34052	1963
1993	105497	4	3662	31	1024913	56673	33062	1828
1994	99724	2	3346	33	1124637	60019	34080	1819
1995	112512	1	3563	34	1237149	63582	36387	1870
1996	109950	1	3733	35	1347099	67315	38489	1923
1997	118437	0	3214	35	1465536	70529	41872	2015
1998	96758	1	3088	36	1562294	73617	43397	2045
1999	111454	0	2793	36	1673748	76410	46493	2123
2000	108128	0	3158	36	1781876	79568	49497	2210
2001	125465	3	3022	39	1907341	82590	48906	2118
2002	134429	1	2750	40	2041770	85340	51044	2134
2003	109004	0	2651	40	2150774	87991	53769	2200
2004	96013	0	2521	40	2246787	90512	56170	2263
2005	96206	1	6478	41	2342993	96990	57146	2366
2006	94900	0	6920	41	2437893	103910	59461	2534
2007	75100	0	6896	41	2512993	110806	61293	2703
2008	83213	0	6628	41	2596206	117434	63322	2864
2009	66081	0	7178	41	2662287	124612	64934	3039
2010	73061	0	7936	41	2735348	132548	66716	3233
2011	89400	1	9702	42	2824748	142250	67256	3387
2012	64171	0	9387	42	2888919	151637	68784	3610
2013	80609	0	11491	42	2969528	163128	70703	3884
2014	85877	0	11071	42	3055405	174199	72748	4148
2015	84720	1	11030	43	3140125	185229	73026	4308
2016	79907	0	9820	43	3220032	195049	74884	4536
2017	70863	0	8565	43	3290895	203614	76532	4735
2018	72703	2	8943	45	3363598	212557	74747	4723
2019	67251	0	7793	45	3430849	220350	76241	4897
TOTAL	**3430849**	**45**	**220350**				**76241**	**4897**

5 YEARS - 2015 TO 2019

Year	Jumps	Fatalities	Jumpers	Account Fatalities	Account Jumps	Account Jumpers	Fatality/ Jumps	Fatality/ Jumpers
2015	84720	1	11030	1	84720	11030	84720	11030
2016	79907	0	9820	1	164627	20850	164627	20850
2017	70863	0	8565	1	235490	29415	235490	29415
2018	72703	2	8943	3	308193	38358	102731	12786
2019	67251	0	7793	3	375444	46151	125148	15384
TOTAL	**375444**	**3**	**46151**				**125148**	**15384**

Risk Factors	1963 – 2019	2015 - 2019
Risk Factor 1 (fatality – jumps)	1: 76,241	1: 125,148
Risk Factor 2 (fatality – jumpers)	1: 4,897	1: 15,384

3.2.6 Four Countries - Finland, France, Norway, Sweden – 1963 to 2019 and 2015 to 2019

Key safety figures for the four countries, for the two periods, 1963 - 2019 and 2015 - 2019, are presented in Table 9 and Table 10.

Table 9, 2019

57 Year Period 1963 - 2019						
Country	**Jumps**	**Fatalities**	**Jumpers**		**Risk 1**	**Risk 2**
					Fatality - Jumps	**Fatality - Jumpers**
Finland	1874812	28	110448		66958	3945
France	24117742	306	1793302		78816	5860
Norway	2120876	39	141719		54381	3634
Sweden	3430849	45	220350		76241	4897
TOTAL	**31544279**	**418**	**2265819**		**75465**	**5421**

Table 10, 2019

5 Year Period 2015 - 2019						
Country	**Jumps**	**Fatalities**	**Jumpers**		**Risk 1**	**Risk 2**
					Fatality - Jumps	**Fatality - Jumpers**
Finland	186378	2	17648		93189	8824
France	3047690	12	490481		253974	40873
Norway	332763	3	28064		110921	9355
Sweden	375444	3	46151		125148	15384
TOTAL	**3942275**	**20**	**582344**		**197114**	**29117**

SPECIAL QUESTIONS

3.3 Special Questions

The special questions, aimed at ascertaining trends, if such exist, and gathering specific information, were asked again for the 2019 survey.

3.3.1 Question1 – How many first jumps were made in your country in 2019?
By Static Line, IAD, JAD (total number)
By Accelerated Freefall (total number)
By Tandem Freefall (total number)

This data can be found, in Table 11, Page 16.
It will be noted that Static Line/IAD is just a little less popular than AFF.

3.3.2 Question 2 - How widely are Square Mains and Square Reserves used on first jumps?
43 countries answered this question.
In 34 of the 43 countries (79%) all first jumps were made on Ram-air Mains and Ram-air Reserves.

The majority of countries now use Ram-air mains and Ram-air reserves on First Jumps.

This data can be found, in Table 11, Page 16.

3.3.3 Question 3 - What percentage of all skydivers uses AAD regularly?
44 countries answered this question.
In 20 countries, 45%, all skydivers use AAD
The use of AAD is widespread; this data can be found, in Table 11, Page 16.

Students
1 ALL Students in 43 countries (98% of 44) used AAD.

Intermediate
2 ALL Intermediate jumpers in 33 countries (75% of 44) used AAD

Expert
3 ALL Expert skydivers in 23 countries (52% of 44) used AAD.

3.3.4 Question 4 - How many times in 2019 did the use of AAD save jumpers' lives?
37 countries answered this question, in one way or another.
36 AAD saves were reported.
Note:- *Firings/saves may not be reported, due to field servicing of AADs.*

The widespread use of AAD would appear to be a major factor in the reduction of skydiving fatalities.

3.3.5 Question 5 - Fatalities breakdown between male and female
Of the 46 responding countries 17 reported fatalities, totalling 44
Of the 44 fatalities 38 (86%) were male and 6 (14%) were female.

Year	Total	Male	Female	Year	Total	Male	Female
2019	44	38 (86%)	6 (14%)	2006	51	40 (78%)	11 (22%)
2018	44	38 (86%)	6 (14%)	2005	64	54 (84%)	10 (16%)
2017	51	46 (90%)	5 (10%)	2004	53	44 (83%)	10 (16%)
2016	39	32 (82%)	7 (18%)	2003	82	67 (82%)	9 (175)
2015	60	54 (90%)	6 (10%)	2002	73	?	?
2014	31	30 (97%)	1 (3%)	2001	90	75 (83%)	15 (17%)
2013	57	50 (88%)	7 (12%)	2000	63	57 (90%)	6 (10%)
2012	53	46 (87%)	7 (13%)	1999	60	55 (92%)	5 (08%)
2011	51	43 (84%)	8 (16%)	1998	72	53 (74%)	13 (18%)
2010	66	57 (86%)	9 (14%)	1997	78	64 (82%)	13 (17%)
2009	62	58 (94%)	4 (06%)	1996	76	65 (86%)	11 (14%)
2008	70	63 (90%)	7 (10%)	1995	64	55 (86%)	9 (14%)
2007	68	64 (94%)	4 (06%)				

3.3.6 Question 6 - How many Tandem Descents were made in your country in 2019?

A total of 1,363,201 Tandem descents were made in the 46 countries.

Tandem jumps amounted to 20% of all jumps, Solos plus Tandems, made in 2019 – in the 46 reporting countries. This figure is consistent with that of previous years.
Tandem jumps compared to Solo jumps in 2019 were 25% - in the 46 reporting countries.

There were four Tandem fatalities in 2019
In one incident the Tandem Student cut away the main canopy at about 50 metres, resulting in the deaths of the Tandem Student and the Tandem Instructor. There were two other incidents, where a Tandem Student and a Tandem Instructor died – three separate incidents in total.

Note:- No figures can be taken for the Tandem Master/Instructor slots, as it is impossible to ascertain how few or how many Tandem skydives each individual Tandem Master/Instructor makes. The figures used are for Tandem Descents, which is the Tandem Passenger/Student and Tandem Master/Instructor as one unit.

3.3.7 Question 7 - How many of the 2019 fatalities were First Jump Students?
Three of the 44 skydiving fatalities in 2019 were First Jump Students.

Year	*Total Fatalities*	*First jump fatalities*
2019	44	3 (7%)
2018	44	0 (0%)
2017	51	6 (12%) this figure includes the four Student Tandem fatalities
2016	39	1 (2.6%)
2015	60	5 (8.3%)
2014	31	0 (0%)
2013	57	3 (5.3%)
2012	53	5 (9.4%)
2011	52	0 (0%)
2010	66	4 (6.1%)
2009	62	6 (9.7%)
2008	70	8 (11.4%)
2007	68	5 (7.4%)
2006	51	5 (9.8%)
2005	64	3 (4.7%)
2004	53	3 (5.7%)
2003	82	2 (2.4%)
2002	73	8 (11%)
2001	92	12 (13%)
2000	63	6 (9.5%)

3.3.8 Question 8 - What percentage of Jumpers use RSL on Reserves?

42 countries responded to this question.

	Students	**Intermediate Jumpers**	**Expert Jumpers**
100% Use of RSL	38 countries (90% of 42)	17countries (40% of 42)	6 countries (14% of 42)

See Table 11, page 16, for full data

3.3.9 Comments
16 of the 46 responding countries added comments or explanatory information in their reporting.

4 SOME CONCLUSIONS

4.1 Equipment

By carefully and conservatively studying the replies it would appear that 35 (80%) of the 44 fatalities occurred with the skydiver having at least one good parachute. This figure includes *Intentional Fast Landings* and *Other Landing Errors*.

Year	Percentage	Year	Percentage	Year	Percentage	Year	Percentage
2019	80%	2012	74%	2005	53%	1998	64%
2018	55%	2011	85%	2004	66%	1997	85%
2017	59%	2010	67%	2003	79%	1996	71%
2016	46%	2009	71%	2002	94%	1995	95%
2015	77%	2008	69%	2001	84%	1994	81%
2014	65%	2007	47%	2000	73%	1993	75%
2013	74%	2006	73%	1999	85%	1992	59%
						1991	75%

It would appear that none of the fatalities resulted from the skydivers not having an AAD.
There does not appear to be any case in which an AAD might have saved any of the 44 fatalities.

Year	Percentage	Year	Percentage	Year	Percentage	Year	Percentage
2019	0%	2012	19%	2005	16%	1998	26%
2018	0%	2011	17%	2004	11%	1997	38%
2017	10%	2010	15%	2003	20%	1996	26%
2016	5%	2009	16%	2002	23%	1995	73%
2015	10%	2008	14%	2001	35%	1994	57%
2014	16%	2007	24%	2000	27%	1993	56%
2013	37%	2006	16%	1999	38%		

4.2 Human Error and Instruction & Reinforcement of Training

It appears that possibly 35 (80%) of the 44 fatalities may have been caused by human error on the part of the skydiver. In the case of some fatalities it is not possible to determine whether human error was or was not a factor, and in other cases human error was clearly not a factor.
This percentage is consistently high over many years and it points to the constant need to reinforce training and safety procedures at all levels in skydiving.

Year	Percentage	Year	Percentage	Year	Percentage	Year	Percentage
2019	80%	2012	74%	2005	84%	1998	68%
2018	68%	2011	87%	2004	79%	1997	88%
2017	78%	2010	89%	2003	77%	1996	92%
2016	74%	2009	79%	2002	90%	1995	94%
2015	70%	2008	67%	2001	94%	1994	94%
2014	74%	2007	81%	2000	80%	1993	90%
2013	89%	2006	80%	1999	84%		

The 2008 figure is low due to there being a relatively large number of fatalities, arising from medical issues, in that year.

It appears that 28 of the 44 fatalities (64%) occurred after the successful deployment of the main parachute – mostly in the categories *Intentional Fast Landings* and *Other Landing Errors.*

Year	Percentage	Year	Percentage	Year	Percentage	Year	Percentage
2019	64%	2015	48%	2011	62%	2007	50%
2018	34%	2014	35%	2010	59%	2006	41%
2017	31%	2013	46%	2009	48%	2005	38%
2016	46%	2012	42%	2008	50%	2004	49%

HUMAN ERROR HAS ALWAYS BEEN, AND CONTINUES TO BE, THE MAJOR FACTOR IN SKYDIVING FATALITIES. THE ATTENTION OF ALL PERSONNEL INVOLVED IN COACHING AND TRAINING MUST BE CONTINUOUSLY FOCUSED ON SAFETY TRAINING AND REINFORCEMENT.

SAFETY IS BEST TAUGHT AT DROPZONES, WHERE STUDENTS, FROM THEIR FIRST JUMP, AND AS THEY PROGRESS, HAVE THEIR ATTENTION DRAWN TO SAFETY ISSUES AND SAFE CONDUCT.

CANOPY HANDLING AND LANDING SKILLS SHOULD FEATURE PROMINENTLY.
THE COMBINED NUMBER OF FATALITIES IN THESE AREAS IN 2019 WAS 16, 36% OF THE TOTAL OF 44

4.3 Final Figures

The number of fatal skydiving accidents in 2019, in the 46 countries which responded to the ISC Safety Survey, was 44.
(See *Table 2, page 4*, for figures for the thirty-one years 1989 – 2019, but please note that these yearly figures are not valid for comparison with one another, due to the mix of responding countries over the years.)

The number of jumps (including Tandems) in the 46 responding countries was - 6,886,653

The number of jumpers (including Tandems) in the 46 responding countries was - 1,534,538

(see *Table 1, Page 4*, for figures with and without Tandem jumps/jumpers)

5 SUMMARY

The aims of the 2019 survey were -

1 To collect information on the number of fatalities in skydiving, worldwide, in 2019.
There were 44 fatalities in the 46 countries which responded.

2 To establish reliable and valid figures for worldwide skydiving activity in 2019.
From the 46 responding countries the following risk factors were determined.
It should be noted that these risk factors are strongly influenced by the mix of responding countries.
Risk Factor 1 1: 156,515 (Fatality per number of Jumps)
Risk Factor 2 1: 34,876 (Fatality per number of Jumpers)

3 To establish reliable and valid figures for worldwide skydiving activity in 2019.
This aim was not fully achieved as only 46 countries responded to the survey.

4 To establish reliable and valid risk figures based on statistics from 4 countries over a 57-year period. This aim was achieved (see below for risk factor figures)
Risk Factor 1 1: 76,465 (Fatality per number of Jumps)
Risk Factor 2 1: 5,421 (Fatality per number of Jumpers)

6 LIST OF APPENDICES

1 Information supplied by 46 countries, *Table 11, Page 16*
2 List of responding countries, 1988 to 2019, *Table 12, Page 17.*
3 Data from USA, the world's largest skydiving country, for 37 years, 1983 – 2019, *Table 13, Page 18.*

7 APPENDICES

Appendix 1, Table 11, 2019

Safety Survey 2019	*Question 1*			*Question 2*				*Question 3*			*Ques. 8*		
COUNTRY	First Jumps made by			% of 1st Jumps on				AAD use by %			RSL on Reserve		
	stat. line or IAD	AFF	tandem	Round main	Sq. main	Round res	Sq. res	Student	Interm.	Expert	Stud %	Inter %	Exp %
Argentina	15	40	1700		100		100	100	70	95	100	70	70
Australia	20	730	168800		100		100	100	100	93	100	unknown	
Austria	500	3000	72		100		100	100	70	85	100	70	50
Belgium	0	430	8447		100		100	100	100	100	100	72	58
Brasil	100	750	0		100		100	100	100	100	25	50	25
Bulgaria	36	3	0		100		100	100	100	98	100	100	95
Canada	no data				100		100	100			100		
Chile	0	210	75		100		100	100	95	100	100	70	75
Cuba	0	0	0					100	5	5			
Czech Rep	1422	344	23143	30	70	40	60	100	100	95	100	90	40
Denmark	2218	0	1968		100		100	100	100	99	100	100	95
Egypt	450	100			100		100	100	100	100	100	100	100
Finland	505	65	1676		100		100	100	100	98	100	100	95
France			47000		100		100	100	100	100	100	100	100
Germany	211	1616	0		100		100	100	99	99	100	40	75
Greece	600	700	10000		100		100	100	100	99	100	80	70
Hong Kong, China	11	0	0		100		100	100	100	100	100	100	100
Hungary	68	36	1		100		100	100	100	99	100	80	70
India													
Indonesia	5	190	0		100		100	100	95	95	95	80	80
Ireland	40	70	1450		100		100	100	100	100	100	100	90
Israel	no data												
Italy	800	200	0	80	20	80	20	20	100	100	20	100	95
Kazakhstan	512	15	8	100		100		100	100	100	100	100	100
Luxembourg	0	15	90		100		100	100	100	100	0	10	10
Mexico	0	56	32720		100		99	100	100	99	100	100	89
Moldova	202	145	336	1	99			100	100	100	100	100	60
Netherlands	1752	452	17408	1	99	1	99	100	100	100	100	96	95
New Zealand	0	165	94063		100		100	100	100	99.9	100	unknown	
Norway	249	333	3319		100		100	100	100	100	100	99	95
Paraguay	15	35	770		100		100	100	100	100	100	100	95
Peru	80	0	288		100		100	100	100	100	100	100	100
Poland	750	520	300	10.5	89.5			100	100	100	100	100	90
Portugal	270	320	3700		100		100	100	100	100			
Russia	24,436	4,401	13,467	85	15	85	15	100	100	100	100	80	0
Slovakia	253	35	3791		100	5	95	100	100	99	100	70	50
Slovenia	17	40	1		100		100	100	95	95	100	90	90
South Africa	285	76	19416		100		100	100	92.59	82.14	100	20	10
Spain	25	410			100		100	100	100	100	100	75	25
Sweden	338	2050	6460		100		100	100	100	100	100	90	75
Switzerland	126	415	12746		100		100	100	100	95	100	50	20
Turkey	0	0	11		100		100	100	100	100	100	100	90
United Kingdom	3529	975	51261		100		100	100	100	99	100	100	98
Uruguay	9	0	0		100		100	100	58	100	100	100	100
USA	10337	37638	607006		100		100	100	95	95	100	90	80
Venezuela	0	17	0		100		100	100	100	100	100	80	50
TOTALS (46 countries)	**50186**	**56597**	**1131493**										

Appendix 2, Table 12, 2019 Responses to Safety Surveys 1988 – 2019

COUNTRY	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Algeria									1																							
Argentina		1	1	1			1		1	1						*			1	1	1	1	1	1	1	1	1	1	1	1	1
Australia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Austria	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1
Belarus									1	1	1	1								1	1											
Belgium		1	1	1	1	1	1	1	1	1				1	1	1	1	1	1	1		1		1	1	1		1	1	1	1	1
Brasil									1											1	1	1	1	1	1	1						1
Bulgaria	1	1	1	1											1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Canada	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chile	1																											1	1			1
China	1	1				1	1	1		1	1	1	1			1	1	1	1	1	1	1	1		1							
Croatia							1				1					1																
Cuba					1																											1
Cyprus					1	1								1	1	1	1		1	1	1	1	1	1	1		1					
Czechoslovakia	1	1	1	1																												
Czech Republic						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Denmark	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Egypt																										1	1	1	1	1	1	1
Estonia															1	1	1	1	1	1	1	1	1									
Finland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
France	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1		1	1	1	1	1	1	1
GDR	1	1																														
Germany	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Greece	1		1	1			1	1	1	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1		1		1	1
Guatemala																									1	1					1	
Honduras				1																												
Hong Kong, China				1	1		1	1									1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hungary	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Iceland		1	1	1	1	1	1	1	1	1	1											1	1	1	1	1	1					
India				1			1	1	1						1	1	1		1		1	1	1				1		1	1	1	1
Indonesia	1			1	1	1	1	1	1	1	1														1	1	1	1	1	1	1	1
Ireland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1										1	1	1	1	1	1	1
Israel	1	1			1	1	1	1	1	1	1															1	1	1	1	1	1	1
Italy	1	1			1		1	1	1	1	1						1	1	1	1	1	1	1				1	1	1	1	1	1
Japan	1	1	1		1	1	1	1	1			1	1	1																		
Kazakhstan									1							1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Kenya						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1								
Korea	1		1	1																												
Latvia																			1													
Lithuania							1	1	1					1	1		1			1	1											
Luxembourg	1	1	1	1	1	1	1		1								1	1	1	1	1	1									1	1
Macedonia							1	1	1	1	1										1		1									
Malaysia				1		1																										
Mexico																									1	1	1	1	1	1	1	1
Mocambique		1				1		1			1	1											1									
Moldova																													1	1	1	1
Montenegro																				1		1		1								
Namibia					1											1								1	1							
Netherlands	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
New Zealand	1		1	1		1								1	1	1		1	1		1		1	1		1	1	1	1	1	1	1
Norway	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Paraguay		1																							1	1						1
Poland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						1
Peru	1				1																			1			1	1		1	1
Portugal							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1
Qatar																										1	1					
Romania			1			1		1									1															
Russia - USSR	1	1	1	1		1				1				1		1		1	1	1	1	1	1								1	1
Saudi Arabia																1	1	1	1	1	1	1	1	1	1	1		1	1			
Serbia																		1	1	1	1	1										
Serbia & Montenegro															1	1	1															
Singapore																					1											
Slovak Republic					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Slovenia					1	1	1								1	1	1		1	1	1	1					1	1		1	1	
South Africa		1	1	1	1	1				1			1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Spain		1	1	1	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sweden	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Switzerland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Thailand	1	1					1	1	1							*	*	*	*	*	*	*	*									
Turkey	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1		1		1	1		1	1	1	1	1
United Arab Emirates					1	1	1	1			1																					
United Kingdom	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Uruguay						1		1	1	1	1										1	1	1	1	1	1	1	1	1	1	1	1
United States	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Venezuela		1	1	1	1	1	1	1	1	1	1		1	1	1						1				1				1	1	1	1
Yugoslavia					1				1	1		1	1	1																		
Zimbabwe	1			1										1		1	1															
TOTAL	34	34	32	35	35	39	41	40	42	37	33	26	27	31	33	39	39	35	39	41	44	40	40	36	37	39	37	37	40	36	42	46

* Military jumping only in Thailand, for years indicated.

Figures from USA for 37 years, 1983 to 2019 inclusive

Appendix 3, Table 13, 2019

YEAR	JUMPERS	JUMPS	FATALITIES				
			Yearly Number	Per 100,000 Jumps	Per 100,000 Jumpers	1 per number Jumps	1 per number Jumpers
1983	101500	unknown	29		28.6		3500
1984	100300	2373000	33	1.2	32.9	71909	3039
1985	102100	2329000	26	1.1	25.5	89577	3927
1986	105600	2246000	30	1.3	28.4	74867	3520
1987	108200	2289000	28	1.2	25.9	81750	3864
1988	110700	2297000	23	1.0	20.8	99870	4813
1989	111880	2352000	36	1.5	32.2	65333	3108
1990	115500	2400000	23	0.9	19.9	104348	5022
1991	121900	2440000	30	1.2	24.6	81333	4063
1992	136528	2600000	27	1.0	19.7	96296	5057
1993	140100	2756870	41	1.5	29.3	67241	3417
1994	140000	2750000	30	1.1	21.4	91667	4667
1995	140000	3000000	28	0.9	20.0	107143	5000
1996	145000	3250000	39	1.2	26.9	83333	3718
1997	145000	3250000	32	1.0	22.1	101563	4531
1998	145000	3250000	47	1.4	32.4	69149	3085
1999	145000	3250000	27	0.8	18.6	120370	5370
2000	145000	3300000	30	0.9	20.7	110000	4833
2001	145000	3000000	35	1.2	24.1	85714	4143
2002	145000	3000000	33	1.1	22.8	90909	4394
2003	145000	3000000	25	0.8	17.2	120000	5800
2004	335000	2520000	21	0.8	7.3	120000	15952
2005	346000	2773000	27	1.1	7.8	102704	12815
2006	372000	2500000	21	0.8	5.7	119048	17714
2007	372000	2500000	18	0.7	4.8	138889	20667
2008	373000	2900000	30	1.0	8.7	96667	12433
2009	373000	2300000	16	0.7	4.3	143750	23313
2010	373000	2500000	21	0.8	5.6	119048	17762
2011	373000	2500000	25	1.0	6.7	100000	14920
2012	564800	3130000	19	0.6	3.4	164737	29726
2013	565000	3730000	24	0.6	4.2	155417	23542
2014	565800	3230000	22	0.7	3.9	146818	25718
2015	566000	3000000	21	0.7	3.7	142857	26952
2016	580000	3800000	21	0.55	3.6	180952	27619
2017	568000	3530000	24	0.68	4.2	147083	23667
2018	590250	2825000	12	0.49	2.35	235417	49188
2019	613745	3346012	15	0.41	2.23	223067	40916

The USA had more jumps and jumpers in 2019 than any other country.

This table, giving risk factors for the thirty-seven years 1983 – 2019 is therefore of particular interest and value, even though the numbers of jumps and jumpers for 2019 were estimated, rather than exact. The number of fatalities for 2019 was exact.

The two columns on the right show the risk factors, one fatality per number of jumps, and one fatality per number of jumpers, year on year.

8 THANKS AND ACKNOWLEDGEMENTS

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