



Aviation Medical Consult

aeromed@neomailbox.net

Tel +31 35 3030100

Perception study on the prevention of
health complaints in
Frequent Flyers

Content

1.	Introduction	3
1.1	Background and objective	4
1.2	Research design / accountability	7
2	Description and identification of frequent flyers	16
3	Outcomes of research among frequent flyers	22
4	Possible scenarios for target group determination Aviation Medical Consult	26



Introduction

Task

Environs International and ibt market research conducted a survey among frequent air travelers.

Background

The air quality in aircraft can give rise to health complaints. Air travelers can experience various complaints, including serious ones that may lead to avoiding behavior: people cannot, may or want to fly anymore.



Introduction

Goal

The aim of the research is threefold:

1. Determine what percentage of the frequent flyers during and after a (long) flight experience physical complaints and/or discomfort and/or fatigue and concentration problems (in a general sense) and - where relevant - determine the nature, frequency, seriousness and consequences of these complaints.
2. Determine the size of the group of frequent flyers with "complaints" and how many of them are suffering "serious, fly-related complaints".
3. Create a profile of both groups, based on which personal and behavioral characteristics of these groups can be distinguished from those without complaints.

Research target group

The research focuses on the frequent air traveler - from now on called frequent flyer or FF - who is defined as someone of 30 years or older, who has carried out at least 6 flights in the past 12 months, of which at least one flight of 5 hours or longer. Here, a flight is defined as a flight movement with one take-off and landing. So a flight with a transfer or a return will count as two flights.

Introduction

Research set up:

Focus is on frequent air travelers (FF)

- It is assumed that frequent air passengers will more often suffer from relevant complaints than occasional air passengers. In addition, the importance of finding a solution will be greater for them than for the occasional air passenger.
- The research was conducted online among members of Toluna's research panel. This is a panel with more than 100,000 Dutch people who have indicated that they are willing to cooperate more or less regularly in research. Participation was asked for an investigation about "traveling". In no way was the introduction referred to complaints, well-being or health in order to prevent 'self-selection'.

Accountability

A sample was drawn from the panel, which is representative of the Dutch population on the basis of gender, age (30 years and older) and regional distribution.

- A total of 8,333 people aged 30 or older were approached for participation; 500 of these have made at least 6 flights in the past 12 months, 1 of which is at least 5 hours - or the frequent flyers (FF) >> this group has completed the full questionnaire.

After completing the fieldwork, the total response was weighted according to the proportions in terms of gender, age and region as it occurs in the Netherlands.

Research period

A pilot survey was conducted in September to test the questionnaire for relevance and comprehensibility. The research reported here took place from 13 to 24 October 2016.

Introduction

Structure of the questionnaire

1. After identifying whether the respondent belonged to the target group or not, some general questions about their travel behavior were asked - as a background and for warming up - such as the furthest destination, favorite airlines, the nature of the flights (business or private).
2. To make the step towards the health complaints in a neutral way, the first question was about all the discomforts that could occur before and during the flight.
3. After that, eight specific complaints were asked, all of which can be caused or exacerbated by the air quality in the aircraft.
4. After determining whether the respondent has had the relevant health complaint during or after a flight, he was asked about the relationship that the respondent made between the complaint and the fact of being onboard a flight; the seriousness of the complaint and any measures to treat the complaint.
5. To all who have experienced 1 or more complaints and who relate this complaint (s) largely to flying - score 4 or 5 on a 5-point scale - are finally asked some questions about the possible consequences and the solutions they have possibly sought: doctor's visit, self-medication, leave earlier, fly back later, etc.

The results described on the following pages are also shown in this order as much as possible.



Description and identification Frequent Flyers

Size of target group FF

Based on the screening-questions, we calculated that 6.6% of the Dutch population aged 30 and older meets the definition of frequent flyer - as recorded by us prior to the investigation.

An estimated 675,000 Dutch people meet this definition.

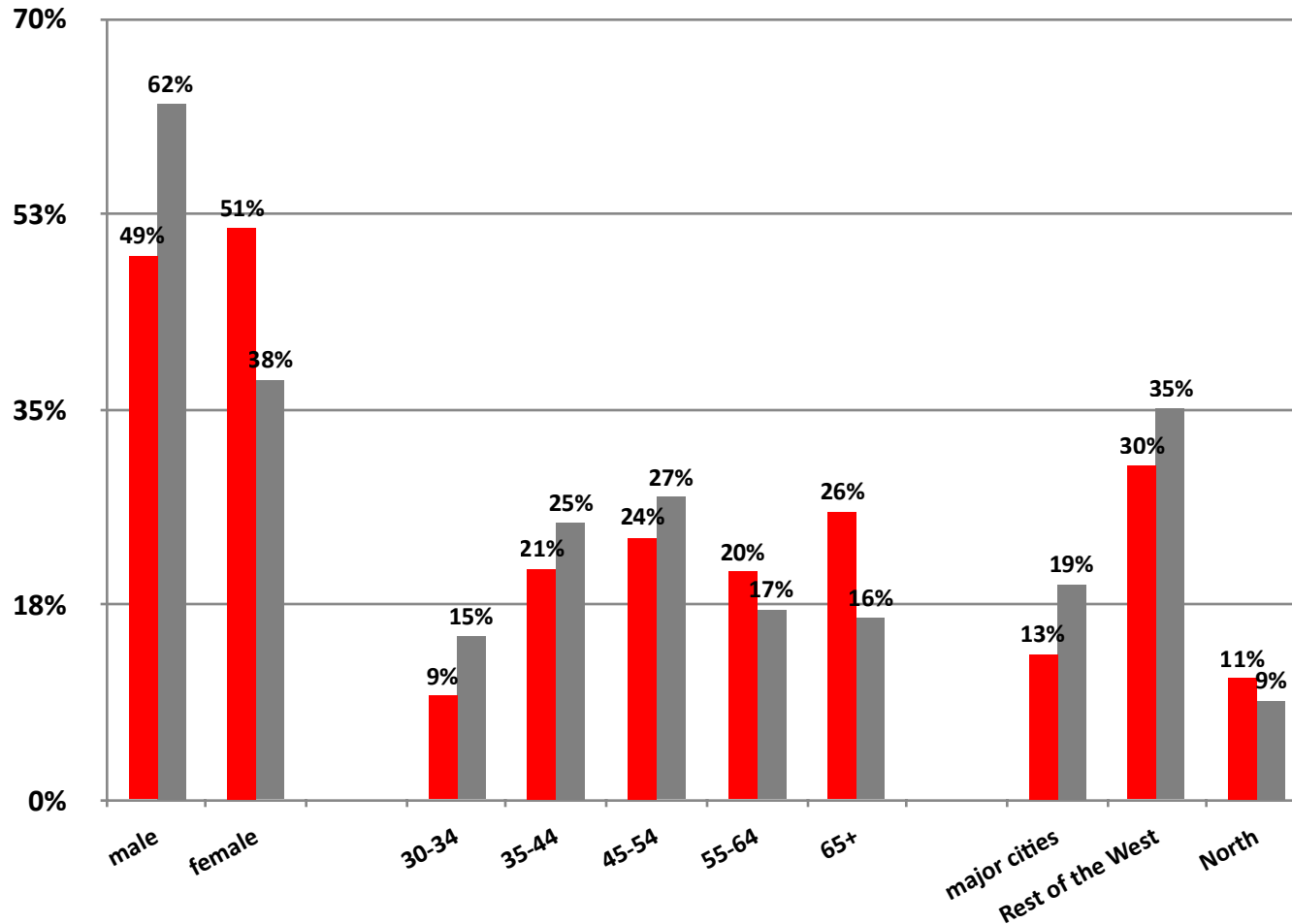
The results in this first chapter describe the Frequent Flyers group in comparison with the Dutch population aged 30 and older (Source: Golden Standard, MOA).

After this description / comparison, the report focuses on the frequent flyer.



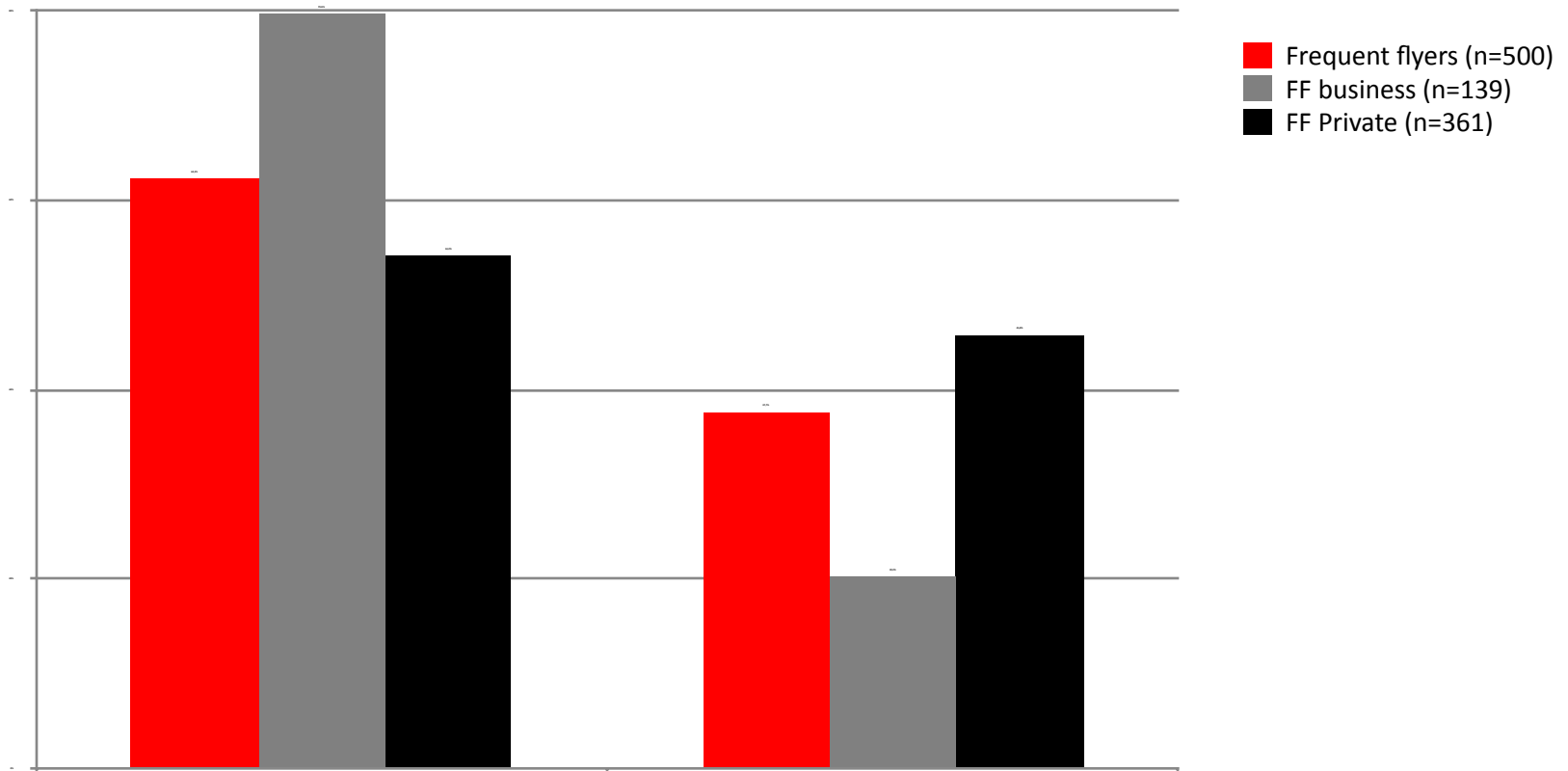
Frequent flyer NL 30+

 The Netherlands 30 Yr and older
 Frequent flyers 30 yr and older



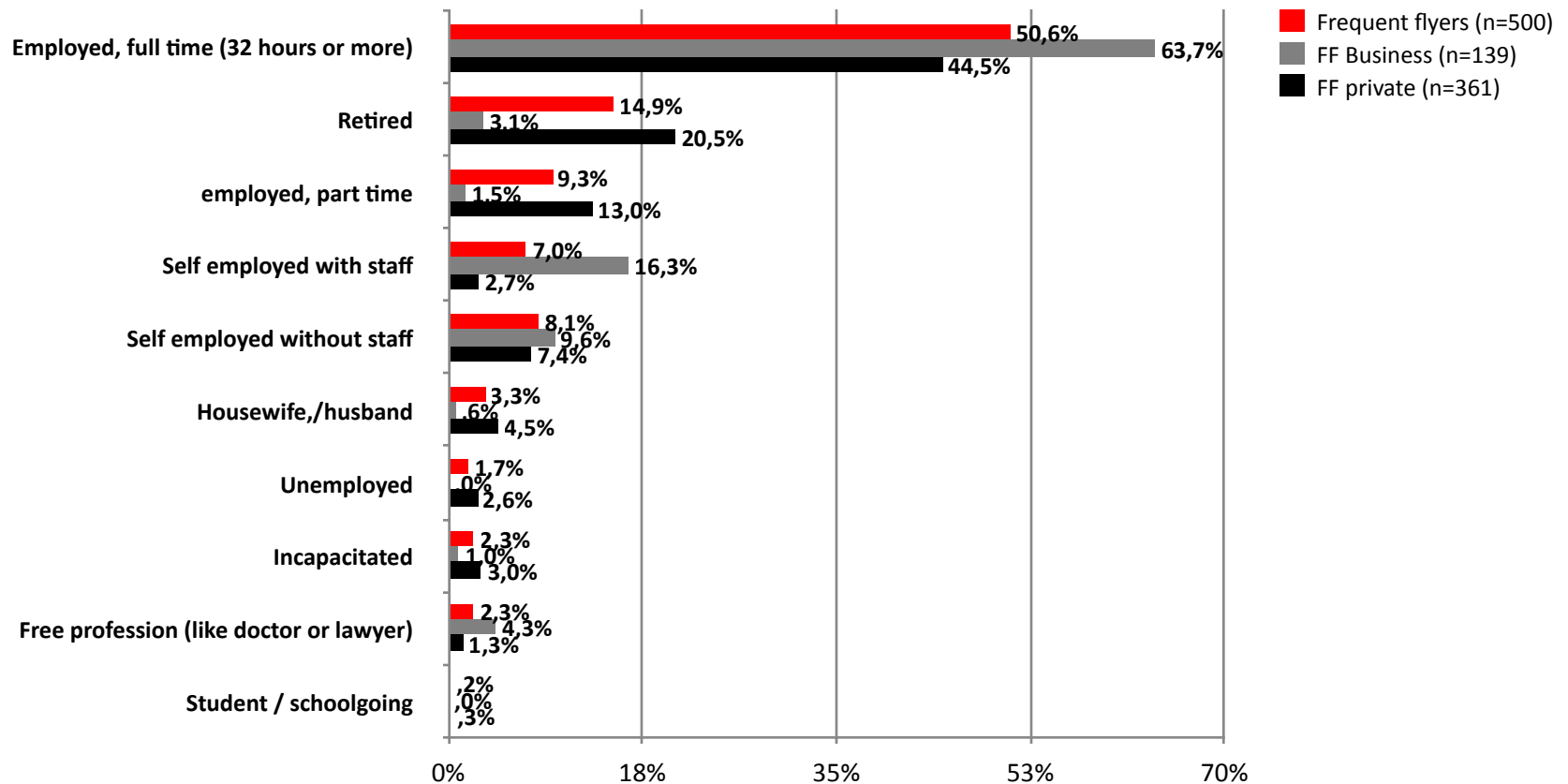
Explanation: The FF is more often male, younger and living in the Western parts of The Netherlands

Gender



Explanation: As we have already seen, the men are overrepresented within the FF, but that is being reinforced within the FF business group. 80% of the business FF is male and 20% is female. For explanation business / private see "Characteristics of flight movements".

Work situation



•Explanation: The business FF is more often employed (as an entrepreneur or full-time employee) than the private FF. Approximately 20% of the private FFs are retired and 6% (now) unemployed or incapacitated for work.



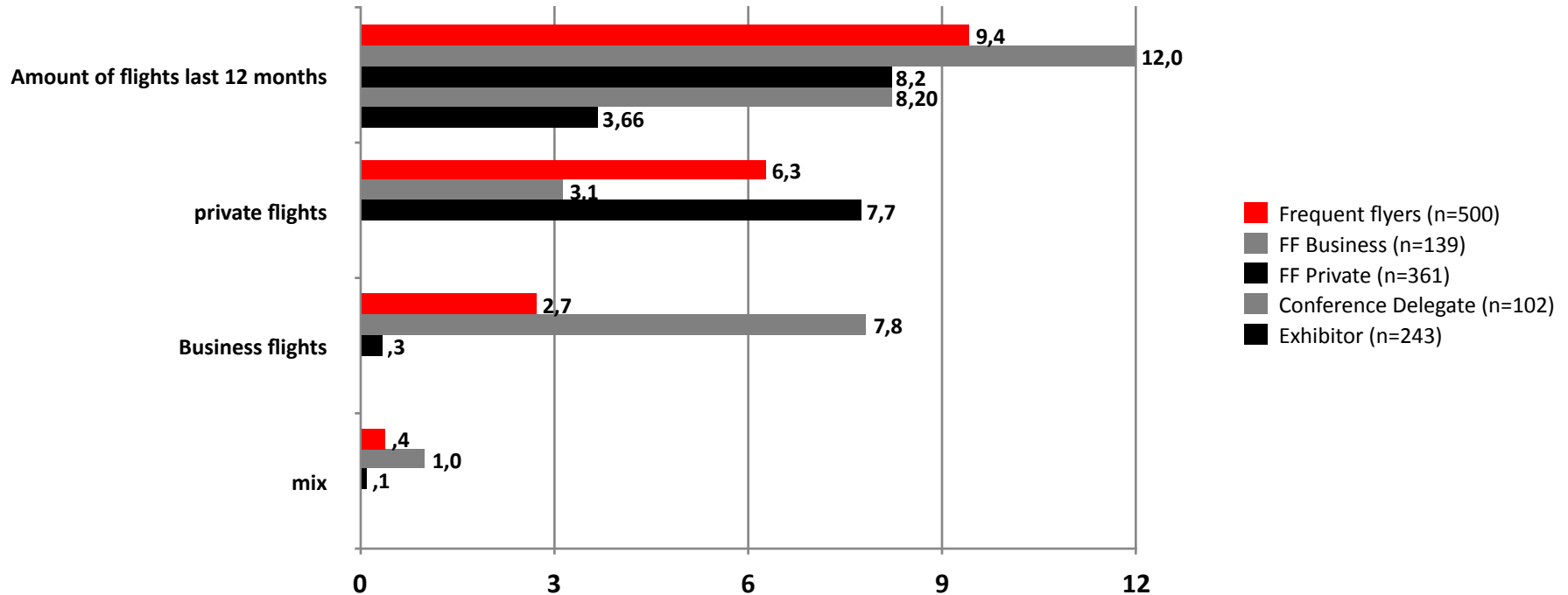
Characteristics of flight movements FF

The following section describes the flight-related backgrounds of the FF target group:

- Number of flights
- Frequency flying in recent years
- Business - private relationship
- Participation in FF programs
- Participation Privium
- Favourite airline



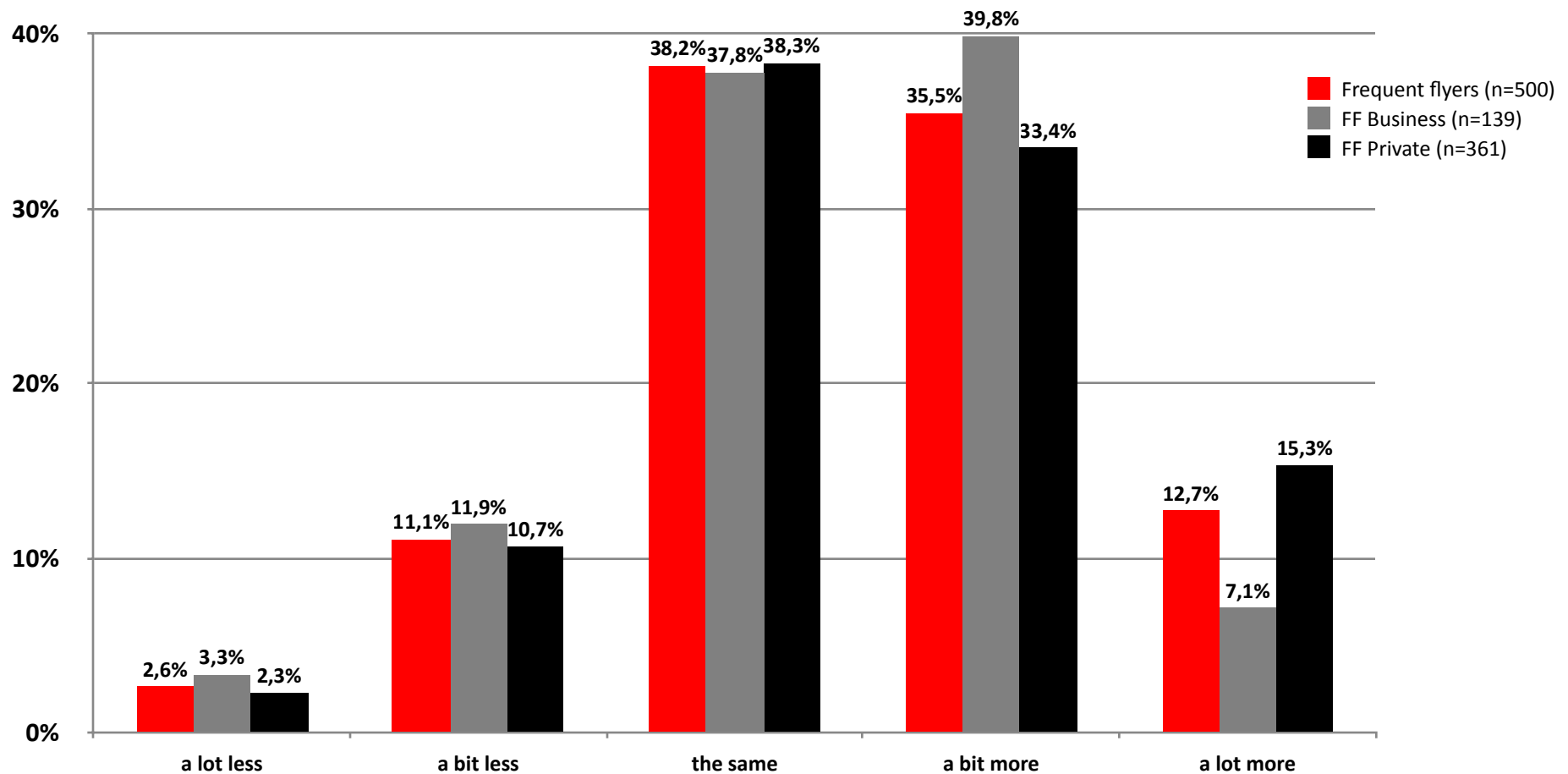
Number of flights; average private/business



Explanation: on average the FF have made 9.4 flights in the past 12 months. The business FF made 12, 8 of which were business. Incidentally, the bandwidth is large: it varies from 6 (= minimum to be FF) to 60 on an annual basis per FF.

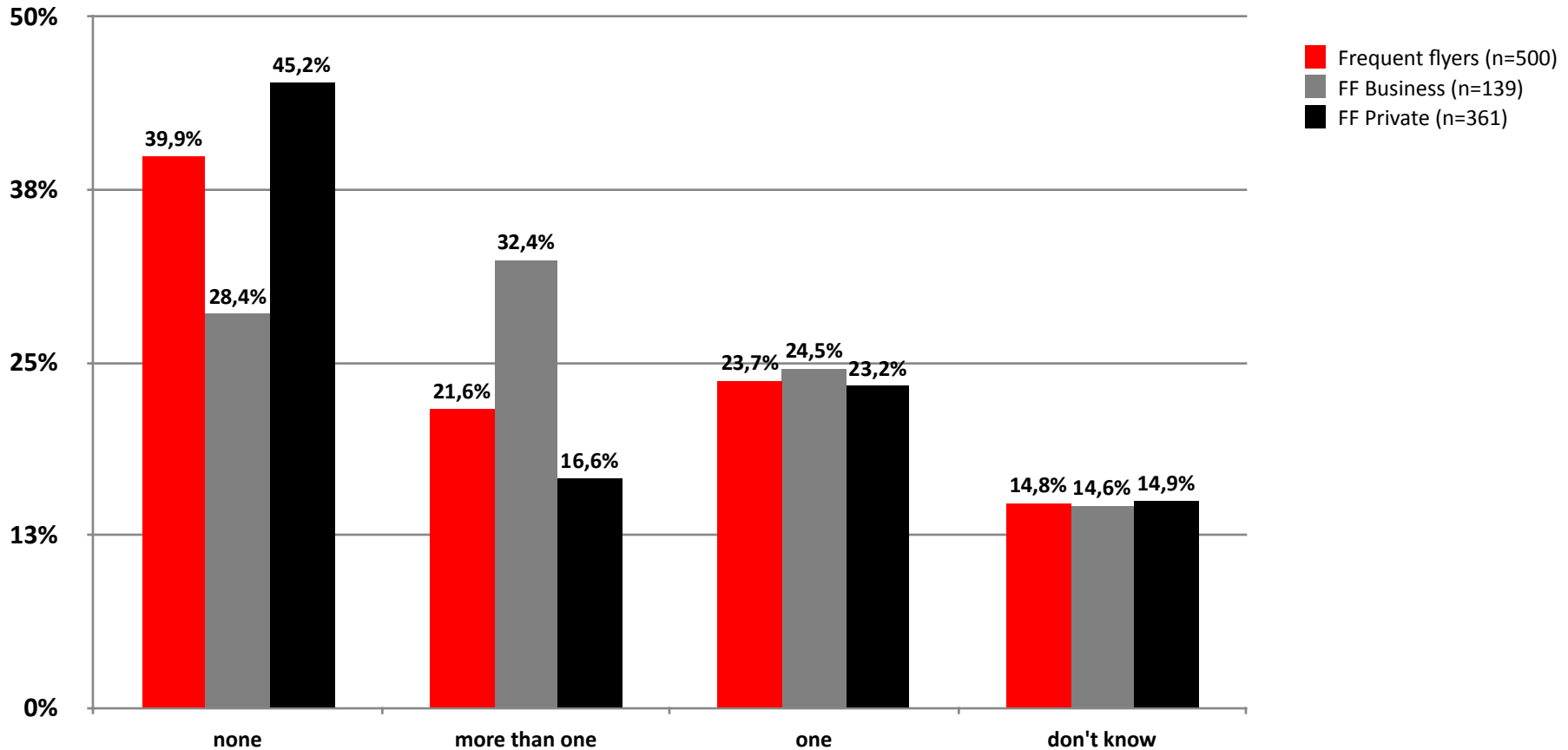
About 1/3 of the flights are business, 2/3 private.

Flight frequency of last year compared with two previous years



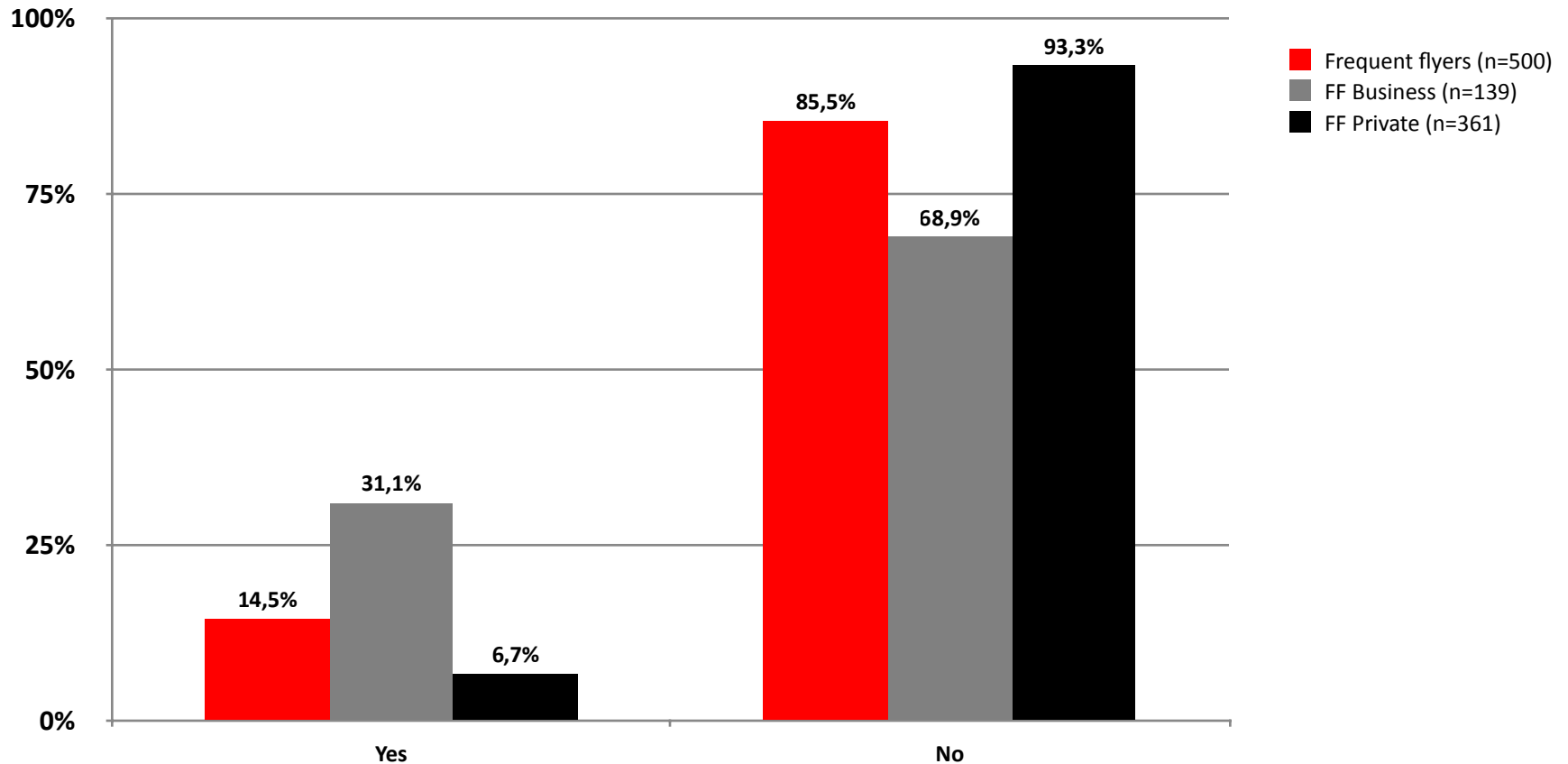
Explanation: $(3 + 11 =)$ 14% flew less this year than before; $(35 + 13 =)$ 48% flew more often; The latter applies to both private and business FF!

Participation in Frequent Flyer programmes



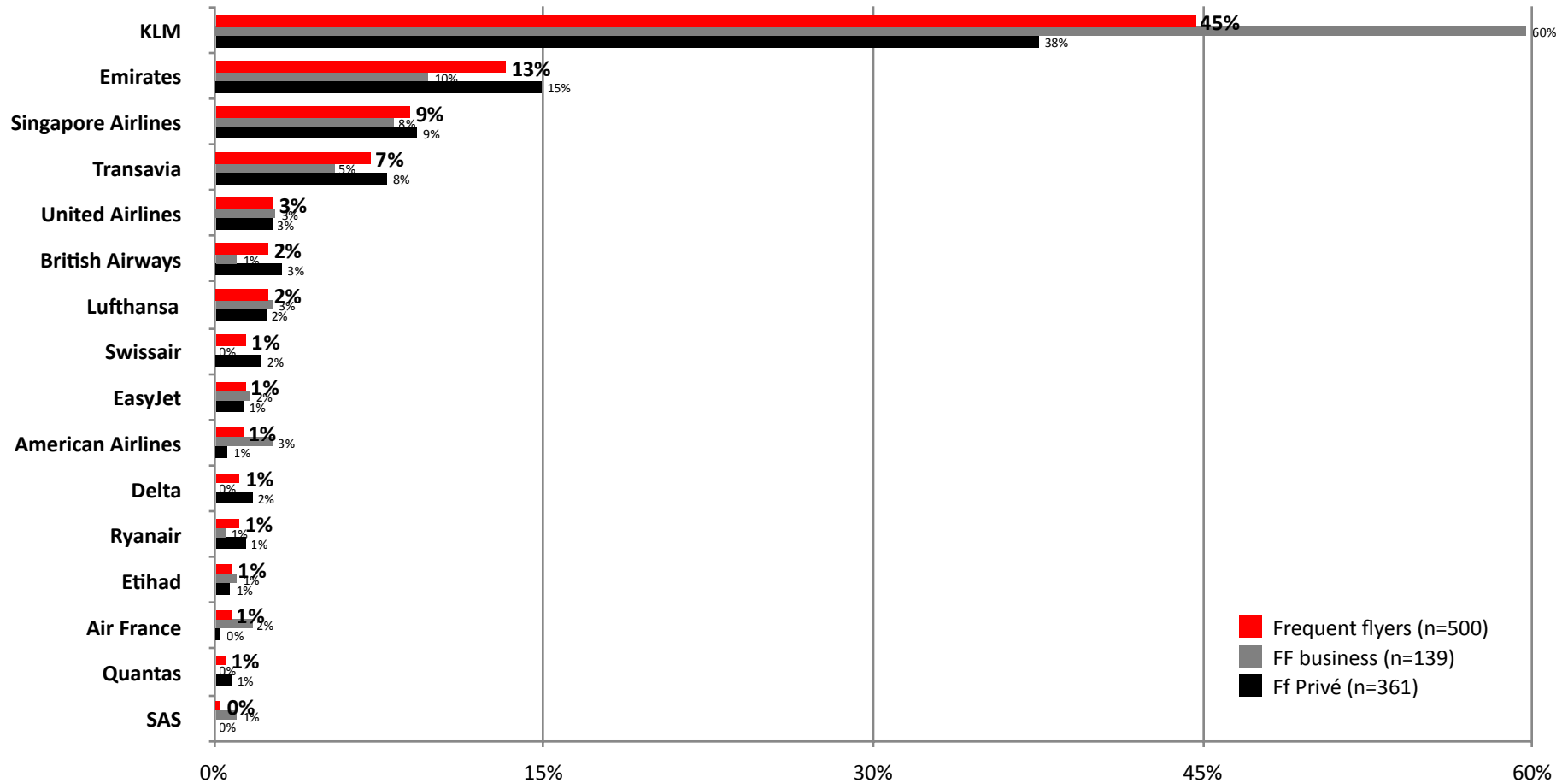
Explanation: 40% of FFs - despite 6+ flights per year - do not participate in an FF program and another 15% do not or not consciously: 45% do. Of the business FF, 57% consciously participates and 32% even more.

Privium member



Explanation: 40% of FFs - despite 6+ flights per year - do not participate in FF program and another 15% do not or not consciously: 45% do. Of the business FF, 57% consciously participates and 32% even more.

Preferred Aircarrier



•Explanation: Dutch FF like to fly with KLM, Emirates and / or Singapore. In the fourth place and as the first of the budget companies, Transavia.



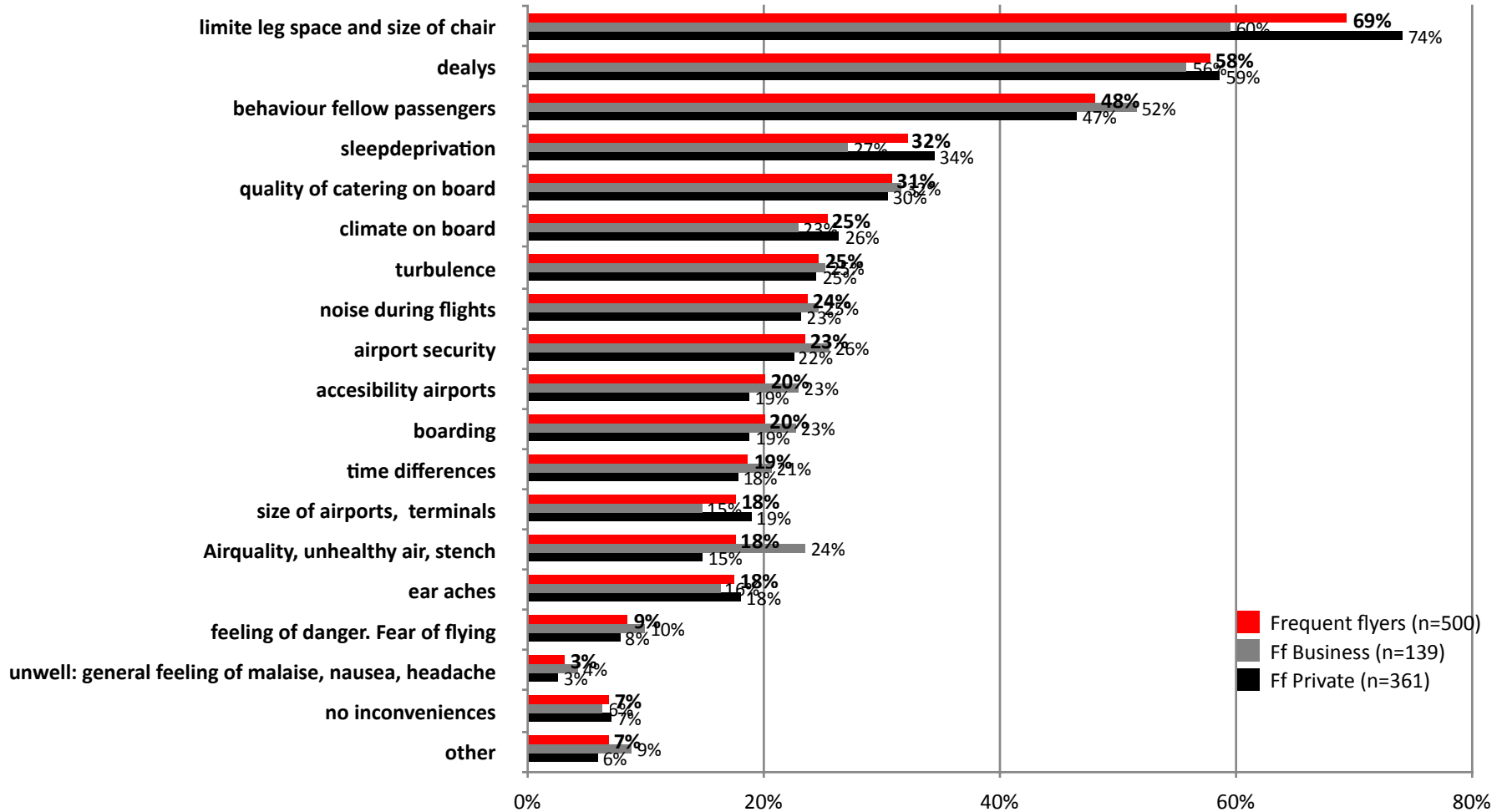
Inconveniences experienced during flights

Before delving deeper into specific health complaints, as a 'warm-up' we asked about the broader spectrum of discomforts that may occur just before, during and after the flight.

Respondents were able to name up to five discomforts, with room to add other problems or discomforts of their own in addition to a list of 19 possibilities,



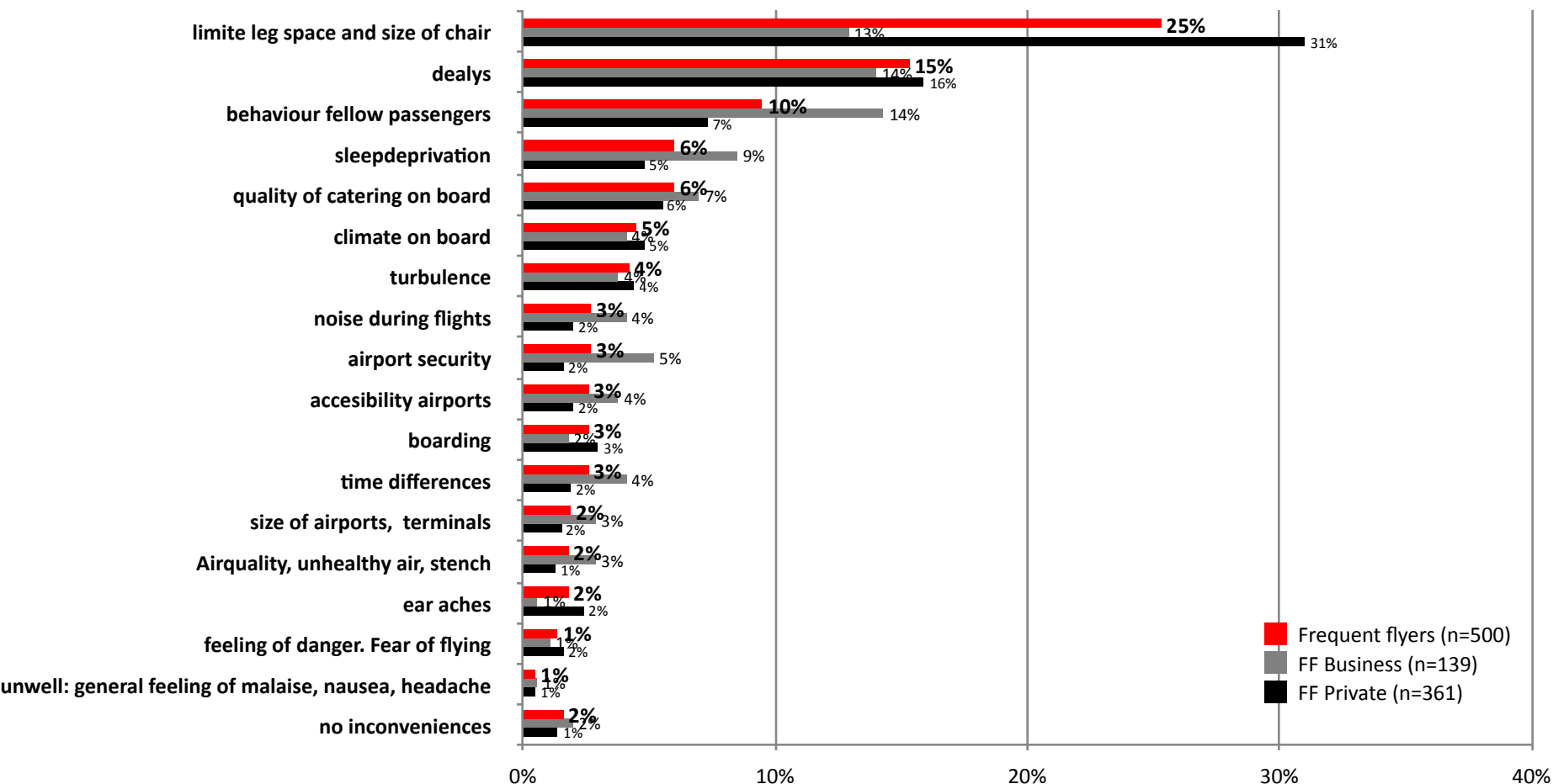
Most frequent inconveniences(max. 5)



Explanation: With approximately 70% of the FF, "small legroom" is the most common discomfort, followed by delays (around 60%) and behavior of fellow passengers (about 50%). Air quality is mentioned by almost 20% of all FF; of the business FF almost a quarter of them call this a major inconvenience.



Greatest discomfort, (zooming in on the first one)



Explanation: about what is perceived as the biggest inconvenience, private and business differ. For the private FF, small legroom is clearly the biggest inconvenience: almost a third calls this first. Business FF experience equally small space, delays and the behavior of fellow passengers as the greatest inconvenience.



PREVALENCE AND SEVERITY OF FLYING RELATED HEALTH COMPLAINTS

The research focuses on the health complaints that can occur in relation to flying.

In consultation with Aviation Medical Consult, 8 specific health complaints have been described that may occur during or after a flight. These complaints are:

- memory disorders and/or concentration problems
- Loss of field of vision
- anxiety attacks / hyperventilation
- headache
- dizziness (balance disorders, ringing in the ears)
- fatigue
- pulmonary or respiratory problems (shortness of breath, short of breath, apnea)
- loss of strength (muscles) / numbness in hands and/or feet

After determining whether the FF is experiencing one or more of these complaints, the following in-depth questions follow:

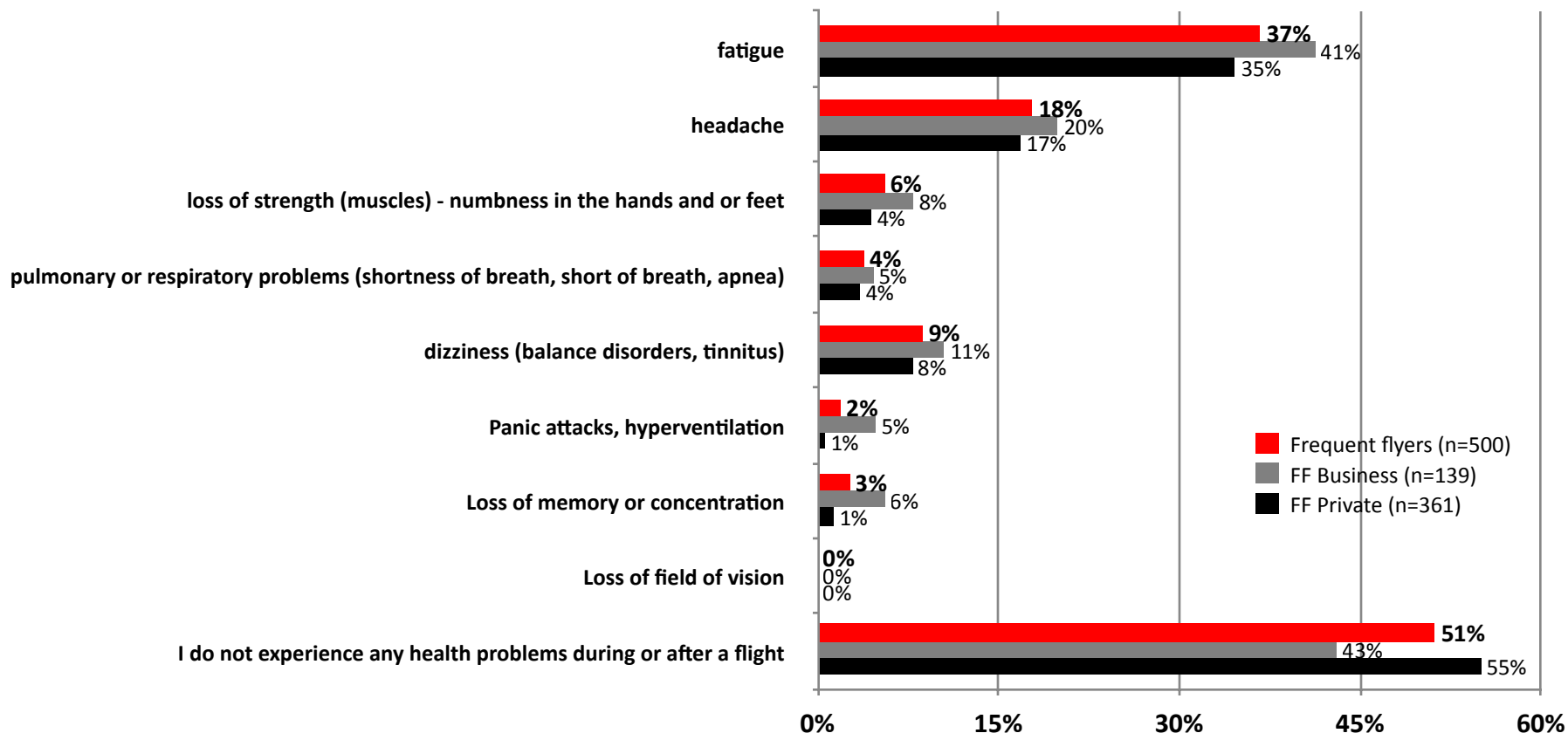
- How often does the complaint occur,
- How serious is the complaint
- To what extent does the respondent attributes the complaint to flying.

These results are shown below for the three most frequently mentioned complaints.

N.B. Four of the complaints are only shown by frequency: due to the limited occurrence of these complaints no meaningful breakdowns can be given for this sample size. 8th complaint, failure of part of the field of vision, is not described in more detail. No reports were made about this in our sample.



Healthcomplaints during or shortly after

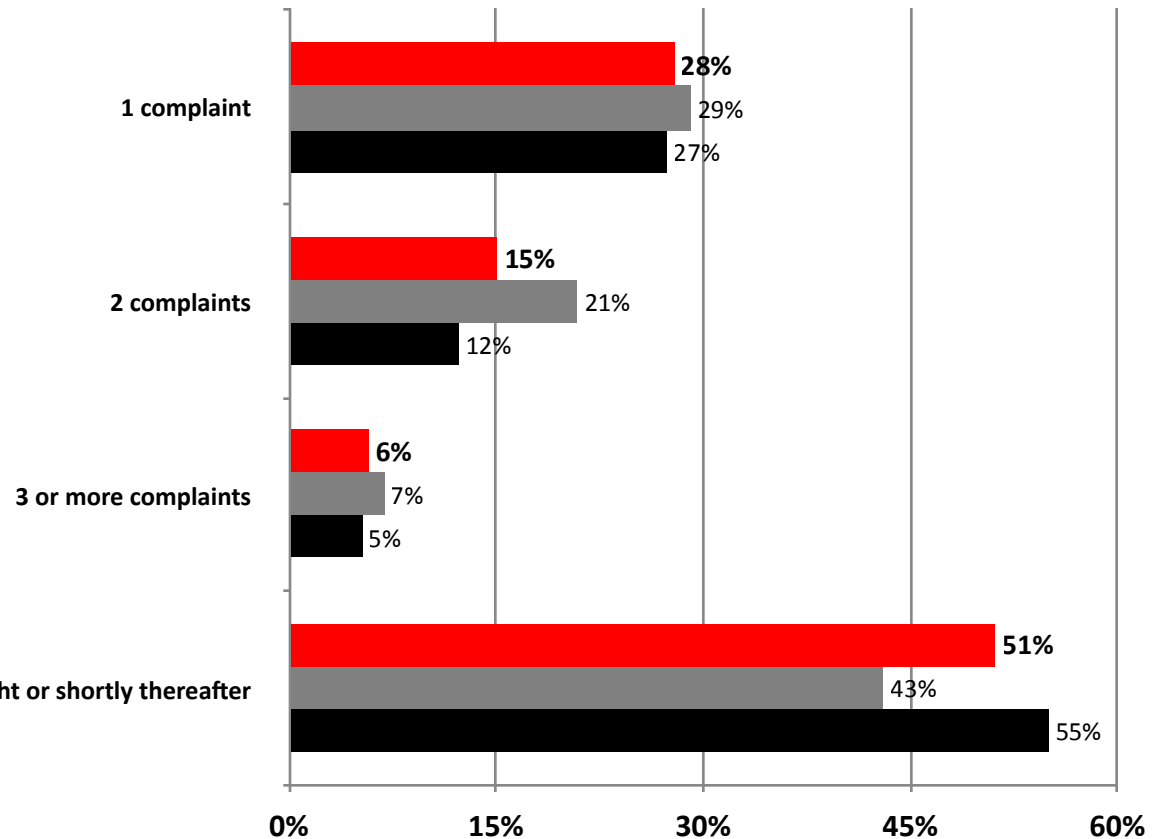


Explanation: over 50% have none of these complaints during or after flying (43% of business FF). • The most frequently mentioned complaint (37% of the FF) is fatigue, followed by headache (18%). This is followed by dizziness (9%) and loss of strength (6%). In all cases relatively more business FF suffer from this than private FF.



Amount of complaints per FF

- Frequent flyers (n=500)
- FF Business (n=139)
- FF Private (n=361)



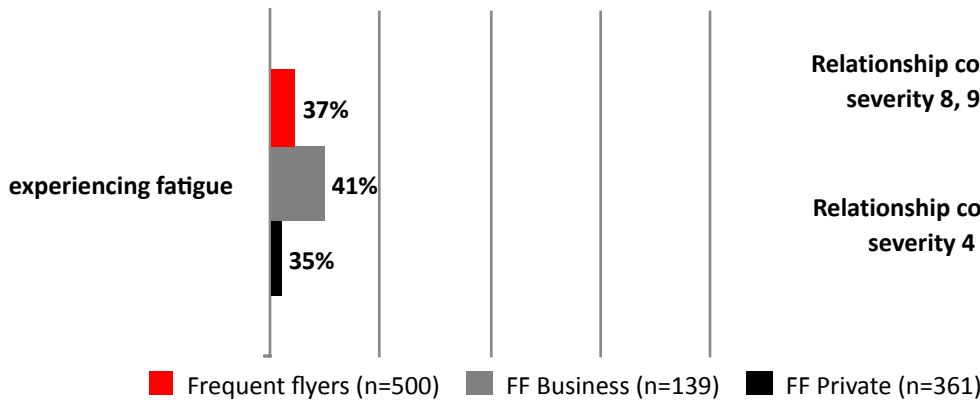
not experience any of the above health complaints during a flight or shortly thereafter

Explanation: 28% mentions one complaint and 21% of the FF has 2 or more of these 8 complaints. ? The business FF not only has complaints more often, but also more than one.

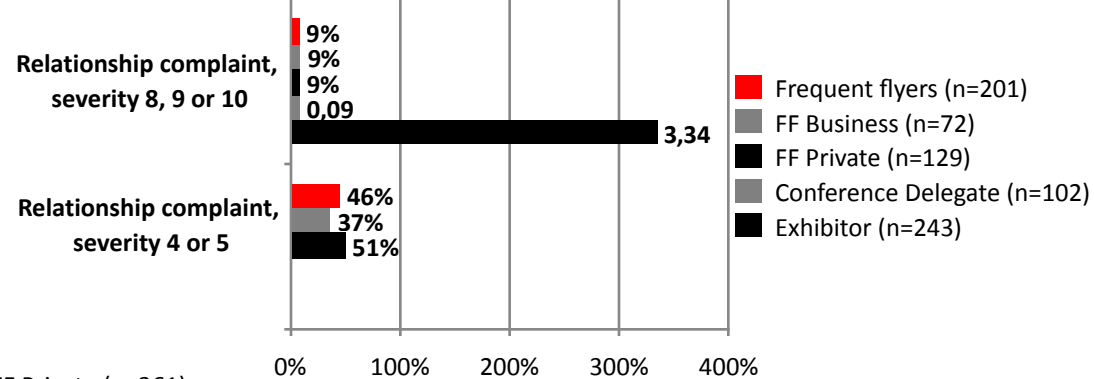


FATIGUE

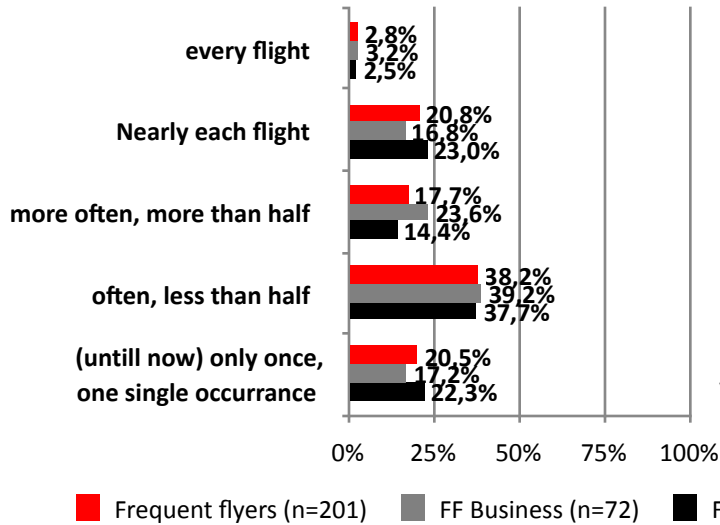
Basis: All Frequent Flyers



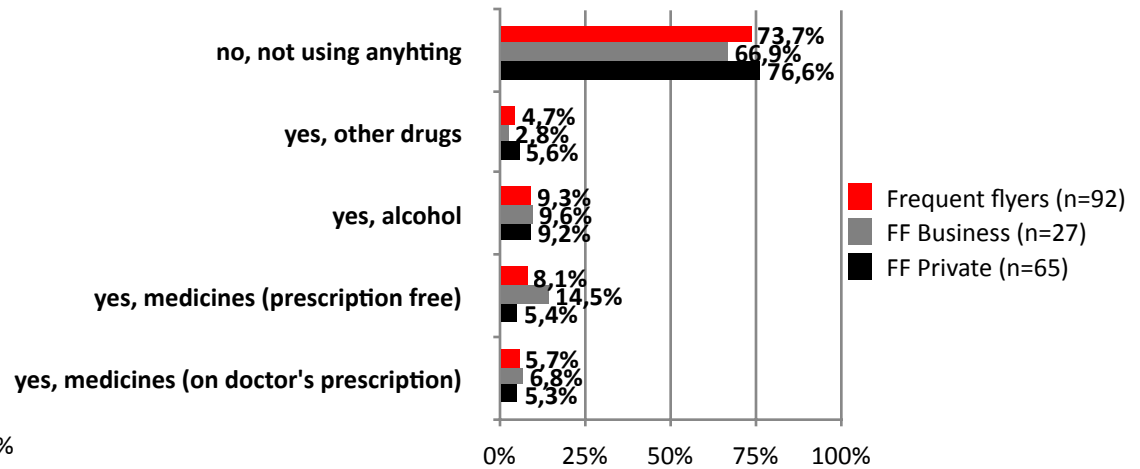
Basis: individuals with a complaint



Basis: suffered a complaint



Basis: has had complaints and sees a connection with flying



Explanation of graphs about Fatigue

37% referred to this complaint (41% of the business FF)?

- 9% rated the complaint 8 or higher (score 10 = very serious)
- 24% endure it (almost) every time and another 18%, so a total of 42% of those with fatigue experience it in more than half of the flights.
- at 38% this was less than half and at 20% it has so far been limited to 1 x
- 46% of those, with this complaint, make a connection with the flight

And a quarter of that (26%) took or took one or more measures against fatigue:

- 9% used alcohol
- 8% took medication without a prescription
- 6% took prescription drugs
- 6% of 46% = 2.8% of those with this complaint
- 2.8% of those with the complaint = $2.8\% * 37\% = 1\%$ of all FF

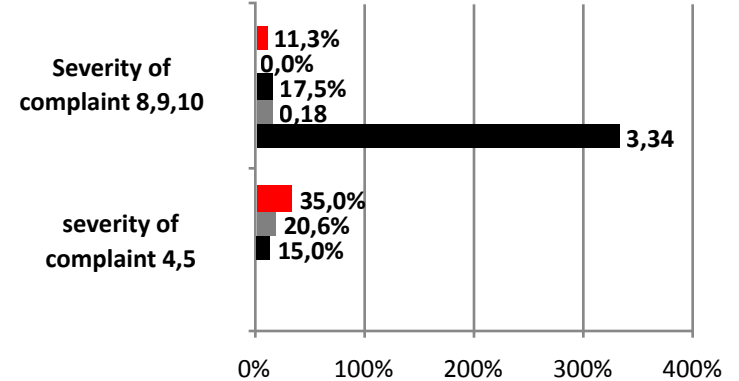


Complaint: Headache, during or after the flight

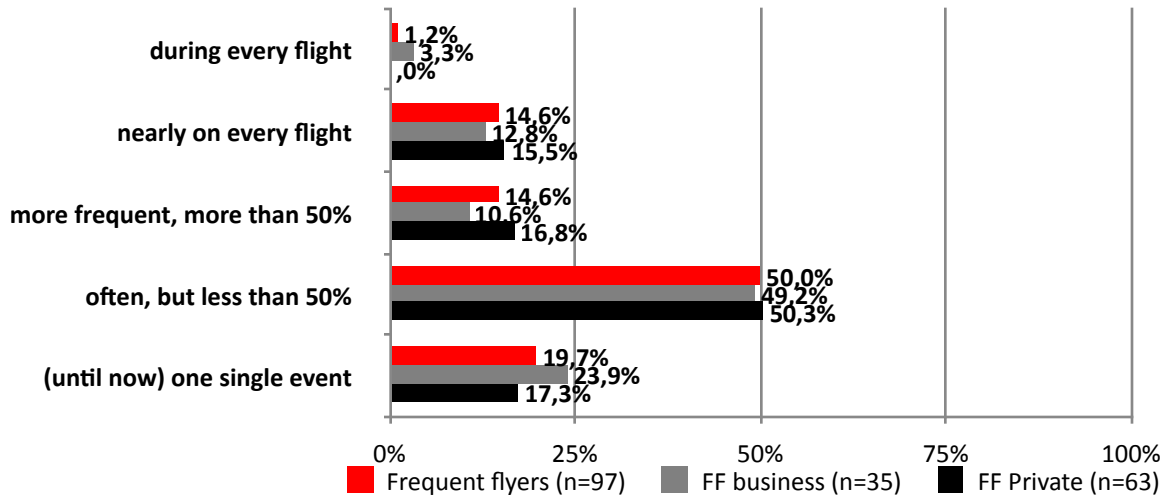
All Frequent Flyers



Has experienced complaint



Experienced complaint



- Frequent flyers (n=97)
- FF Business (n=35)
- FF P (n=63)
- Conference Delegate (n=102)
- Exhibitor (n=243)



Notes to charts “Headache”

18% mentioned this complaint (20% of the business FF)?

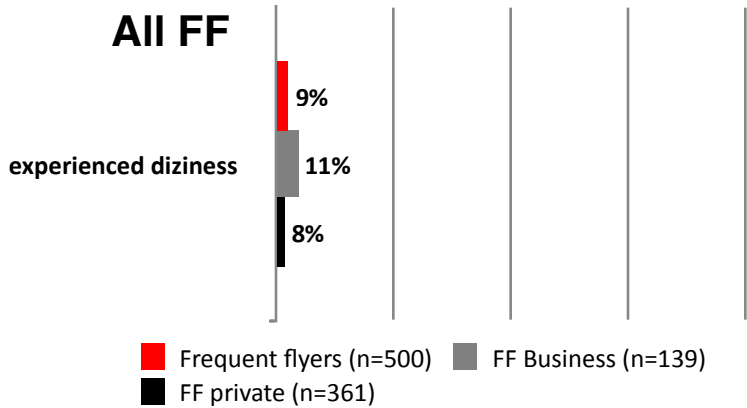
- **Of these, 11% give the complaint score 8 or higher (score 10 = very serious)**
- **16% have it (almost) every time and another 15%, so in total about 30% of those with headache complaints are affected by more than half of his / her flights.**
- **at 50% this was less than half and at 20% it has been limited to 1 x so far**
- **35% of those with this complaint make a connection with the flight**
- **56% of these take one or more measures**

Given the small numbers in the sample, a further breakdown by measures is not justified

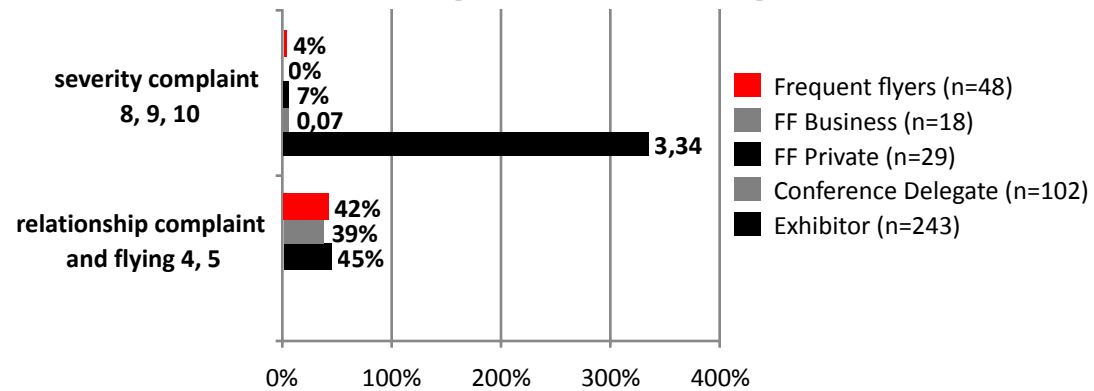


Complaint: Dizziness

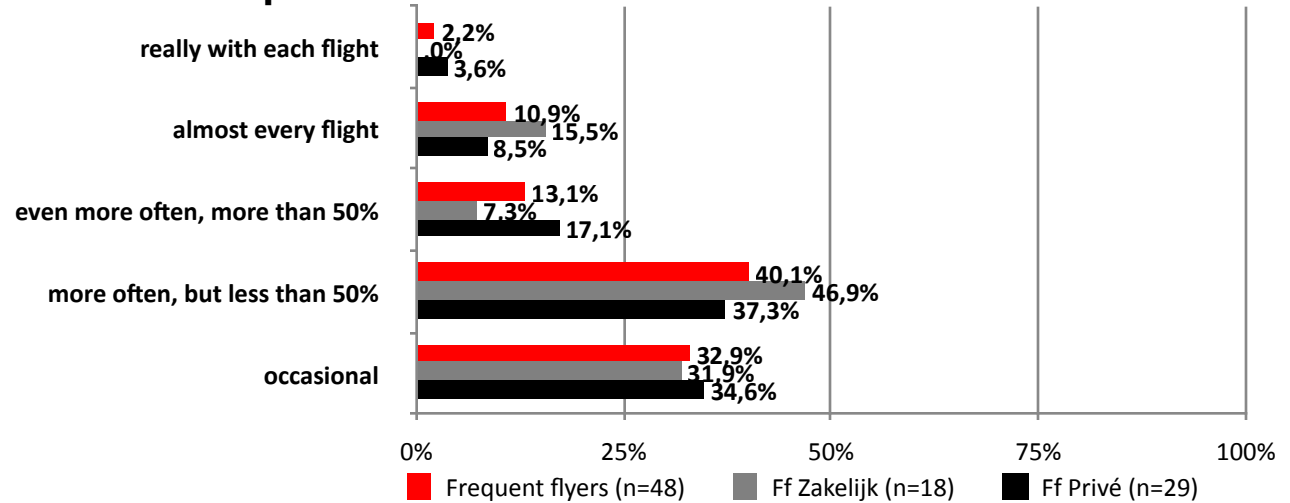
All FF



Has experienced complaint



Has experienced complaint



Notes to graphs Dizziness

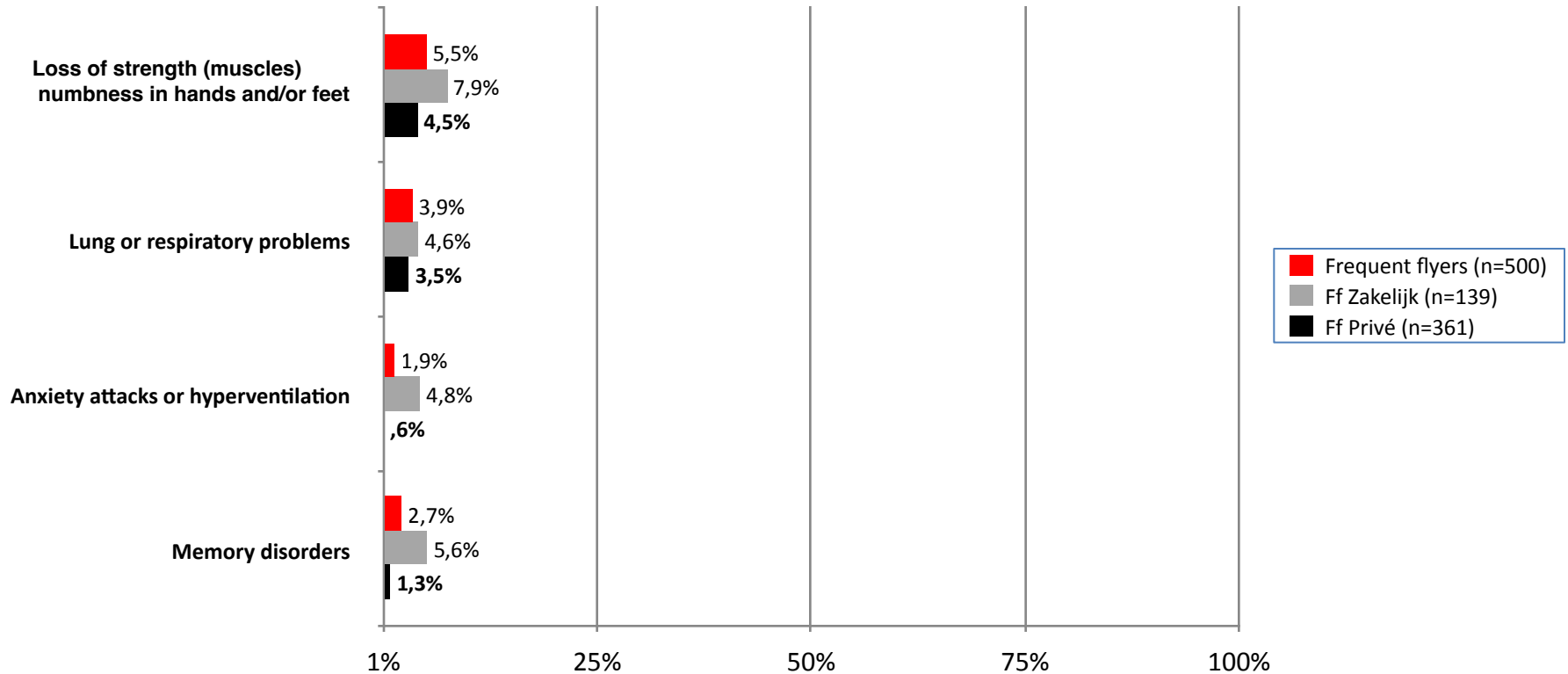
9% mentioned this complaint (11% of business FF)

- **Of these, 4% gave the complaint score 8 or higher (score 10 = very serious)**
- **And 13% have it (almost) every time and another 13% - so total 26% - of those with dizziness complaints experience it on more than half of his/her flights.**
- **for 40% it was less than half and for 33% it has been limited to once so far**
- **42% of those with this complaint link it to the flight**
- **And of these, 35% take or took one or more measures**

Given the small numbers in the sample, a further breakdown by measures is not justified

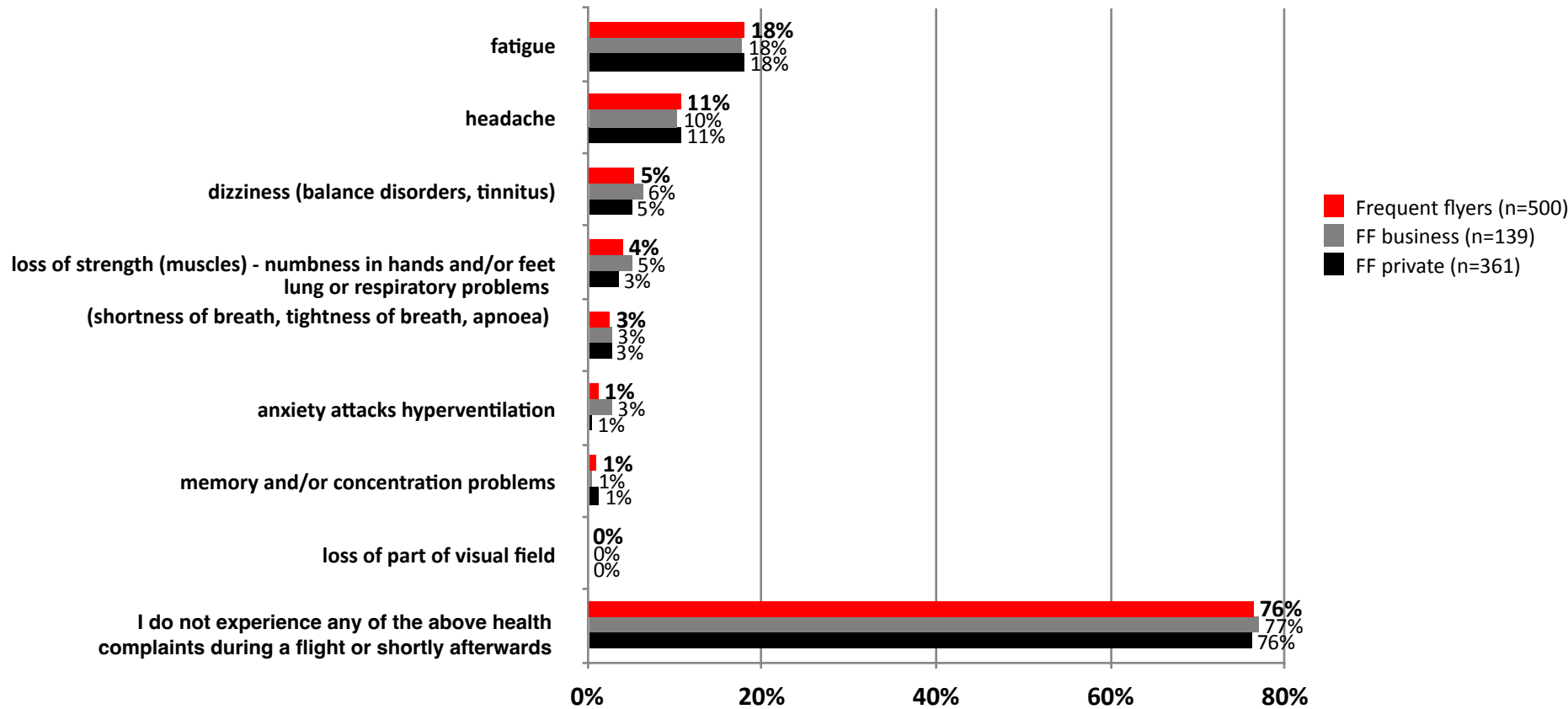


Relatively infrequent symptoms



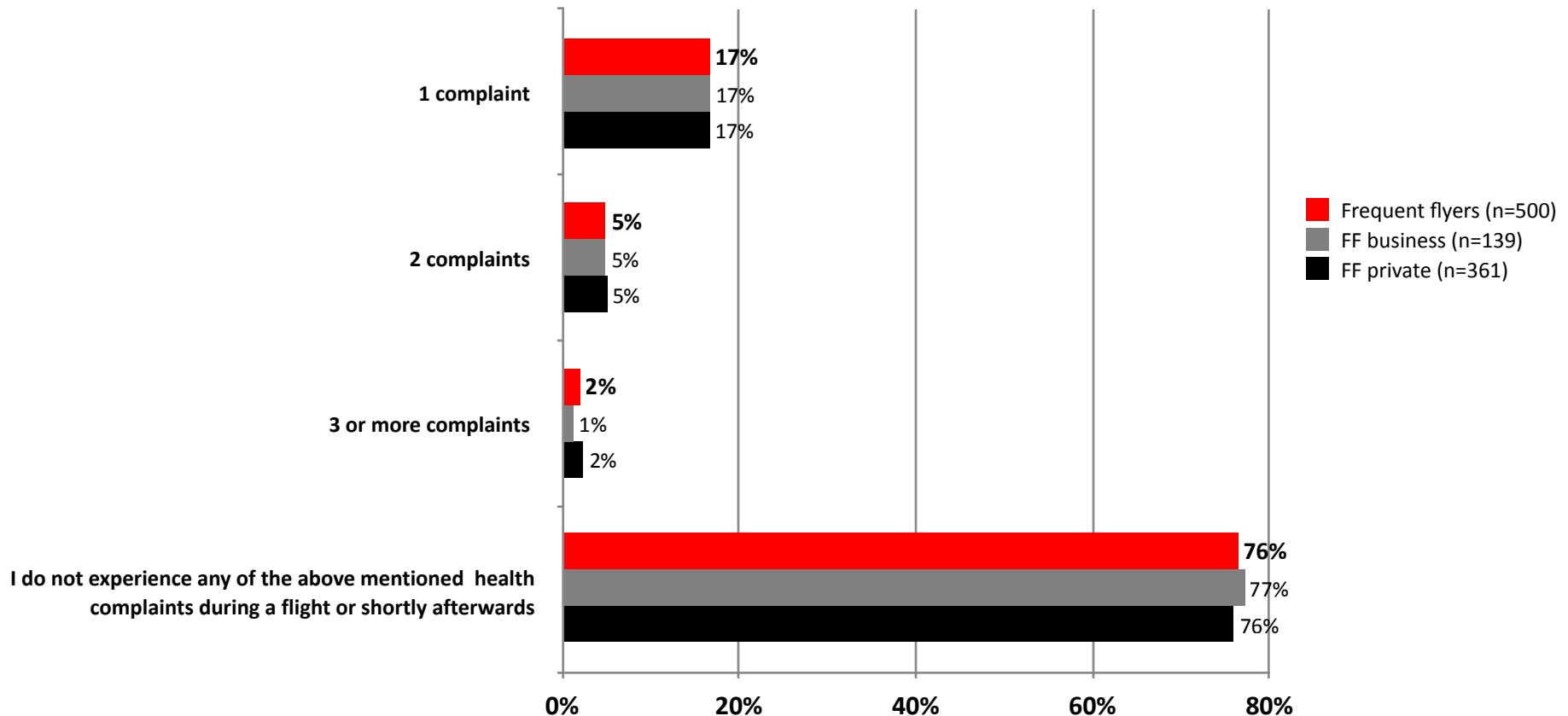
Note: The remaining complaints are experienced by 2-6% of FF, relatively a bit more often by business FF. Due to the limited occurrence of the complaint, a further breakdown is not statistically justified.

Experienced complaints by FF, by FF related to flying (score 4-5 on scale 1-5)



Notes: most frequently mentioned complaints related to flying by the FF are fatigue and Headaches.
1 in 20 reported experiencing dizziness, 1 in 25 experienced loss of strength/deafness in hands and/or feet.

Number of complaints per FF, by FF related to flying (score 4-5 on scale 1-5)



Note: Distinction between business and private FF has disappeared (see slide 22).
Relatively speaking, business FF relate the complaint to flying less often than private FF do, therefore.

Actions and experiences following perceived health complaints strongly attributed to 'flying'

The final part of the survey zoomed in on the FF with health complaints that they themselves strongly relate to flying - or have given a score of 4 or 5 on a five-point scale: “To what extent do you attribute your complaints to flying?”

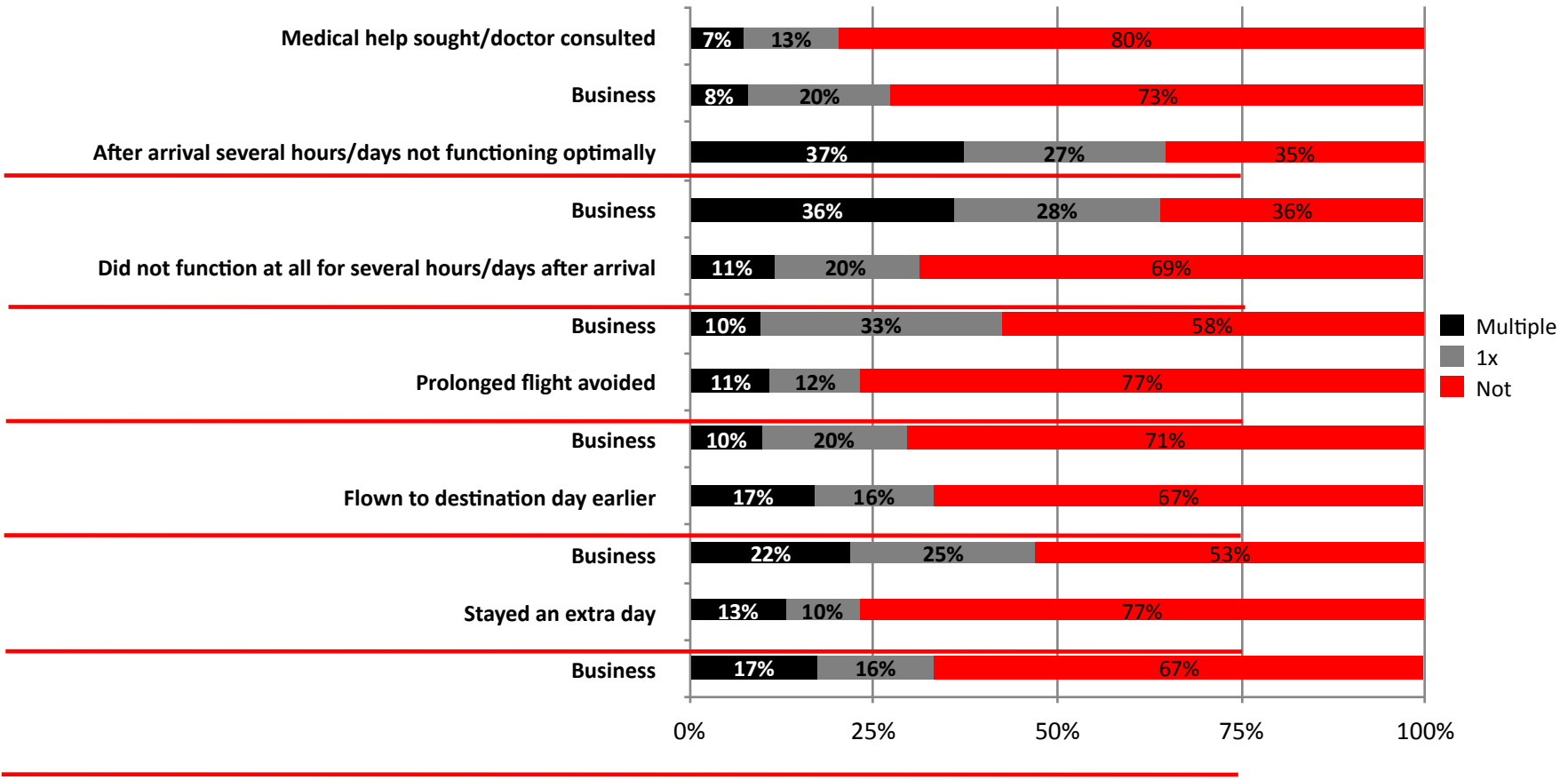
They were asked about possible actions and changes in their behaviour, to find a solution to their health complaints and about functioning problems due to flying.

The group of FF under consideration comprises 23.6% of all FF.



Actions taken & experiences Base:

All FF with 1 or more flying-related complaints, 23.6% of all FF; 22.9% of all business FF



Note: The first bar with description always concerns all FF with 1 or more complaints, followed by the outcomes of business FF. Not being able to function optimally is the most frequently encountered experience (over 1/3 of all FF with complaints). 1 in 5 business FF fly to the destination a day earlier to deal with the complaints locally first.



For consideration - discussion

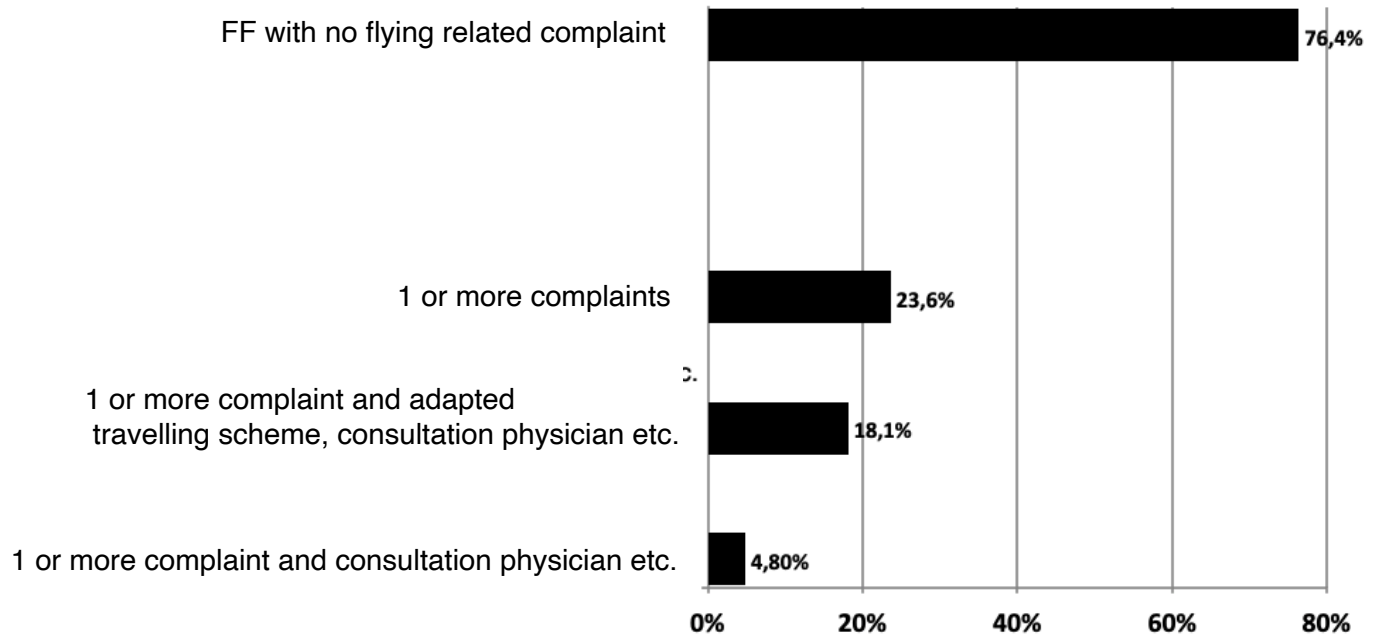
- It can be concluded from the results that:
 - 49% of FF experience to a greater or lesser extent one or more of the relevant complaints
 - 25% of FF do experience one or more of these health complaints, but do not relate them, or only to a limited extent, to flying.
 - It follows that: 24% of all FF have experienced one or more health complaints, which they strongly or completely relate to flying (the flight).
- Initially, 24% of FF have at least one relevant complaint and relate it to flying.

On the following slides, the group with complaints is further defined for the discussion.

- This always together with some characteristics that show how this target group compares to the "average" frequent flyer; this as far as the size of the target group in the sample allows for.



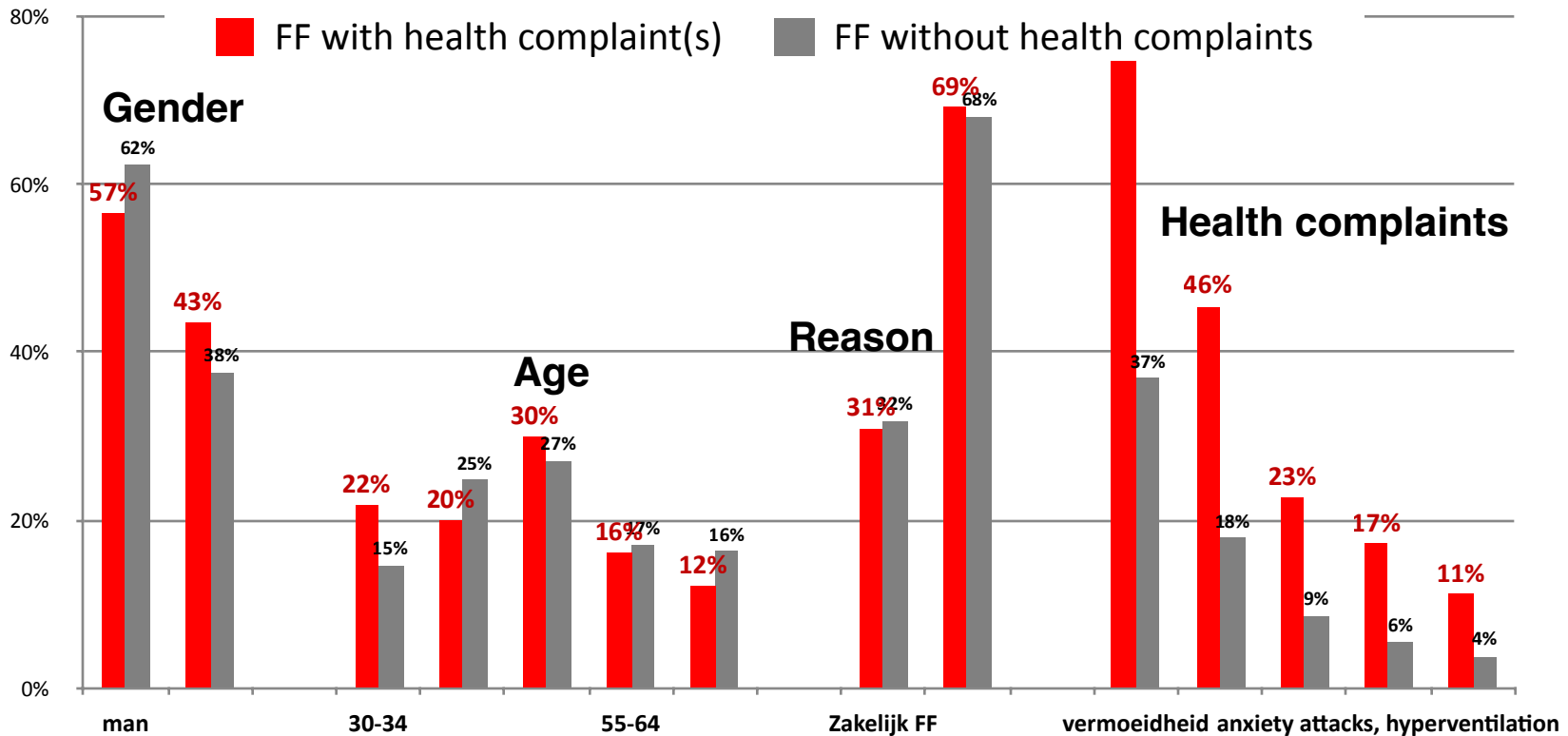
FF with 1 complaint largely related to flying



Should it be chosen for the target group definition that FF have sought medical help for their health complaint at least once (i.e. help is already being actively sought), the potential target group would consist of 4.8% of FF: about 30,000 Dutch people aged 30 years or older. The profile on the next slide is given for all FF with at least 1 fly-related complaint - so without the addition of consulting doctor.



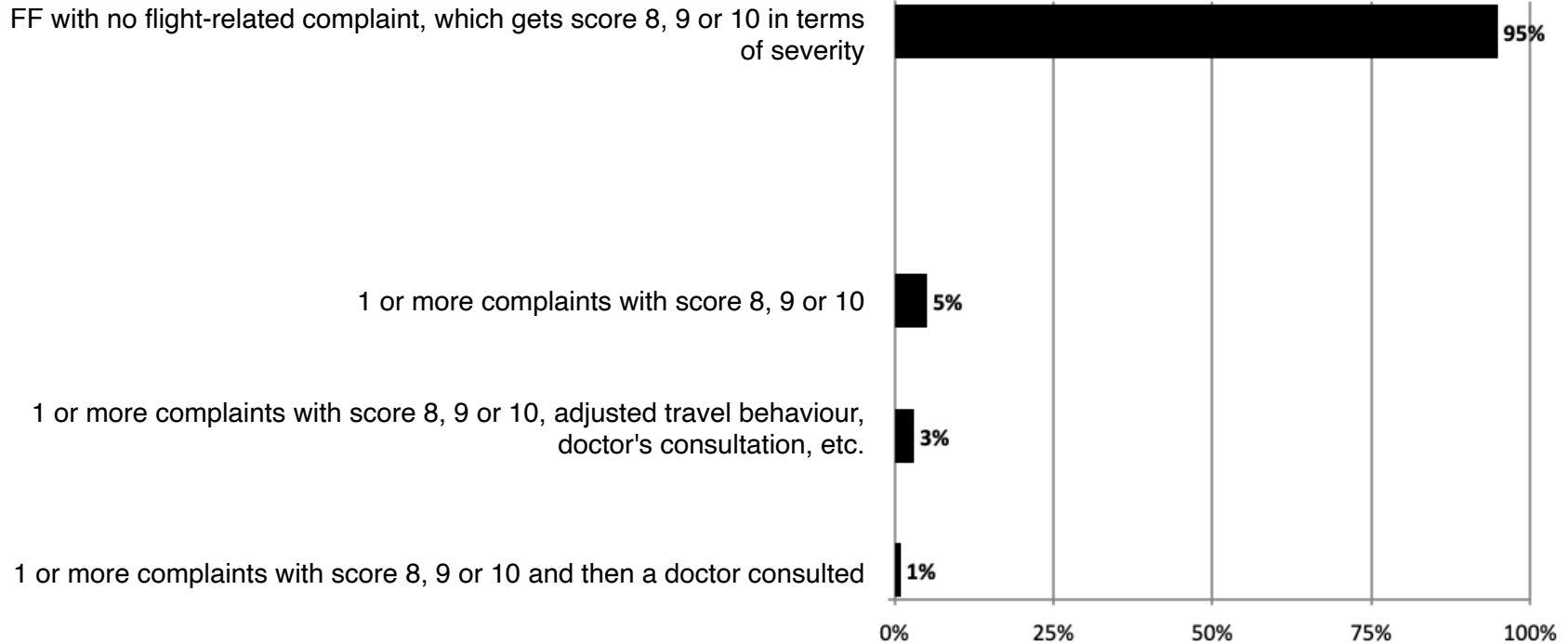
Profile FF with flight-related complaint(s) vs FF



Notes on how to read: e.g. gender: of the FF without complaints, 62% are male, 38% female; of the FF with complaints, 57% are male, 43% female.

Impression: FF with flight-related health complaints are relatively more often female (absolutely more often a man!), complaints are relatively more often between 30 and 34 years of age. Although in absolute terms complaints are more common among private FF, in relative terms there is no difference.

FF with 3 or more complaints, largely related to flying, scale of 1 to 10



In terms of size, the group consists of those who: 1 or more flight-related health complaints, in which 1 of the complaints is at least so serious that on a scale of 1-10 an 8 or higher is given for it, consists of approximately 34000 Dutch people aged 30 years or older. Given the limited sample size (5.1%, unweighted 23 respondents) no further characterisations of this group can be given.