
NASA
SPACESTATION
LIVE

1
00:00:08,870 --> 00:00:07,030
ever wonder what happens to all of the

2
00:00:11,270 --> 00:00:08,880
data that comes back from astronaut

3
00:00:13,270 --> 00:00:11,280
experiments on the space station iss

4
00:00:15,110 --> 00:00:13,280
commentator lori meigs at nasa's

5
00:00:17,189 --> 00:00:15,120
marshall space flight center met a man

6
00:00:18,950 --> 00:00:17,199
who has the job of keeping the stats on

7
00:00:22,470 --> 00:00:18,960
all of that for the human research

8
00:00:24,070 --> 00:00:22,480
program at nasa biostatistician

9
00:00:26,150 --> 00:00:24,080
we talk a lot about all these

10
00:00:28,950 --> 00:00:26,160
experiments and all this biological

11
00:00:30,710 --> 00:00:28,960
research but somebody has to kind of

12
00:00:33,670 --> 00:00:30,720
keep the stats on all that is that your

13
00:00:35,110 --> 00:00:33,680

job yeah so so what a biostatistician

14
00:00:37,190 --> 00:00:35,120
does

15
00:00:38,470 --> 00:00:37,200
ideally we like to get involved

16
00:00:40,549 --> 00:00:38,480
in the research

17
00:00:42,709 --> 00:00:40,559
program as it's just starting to be

18
00:00:44,630 --> 00:00:42,719
developed as the principal investigator

19
00:00:46,709 --> 00:00:44,640
team is just starting to pull their

20
00:00:48,470 --> 00:00:46,719
ideas together about what kind of

21
00:00:50,389 --> 00:00:48,480
experiments they want to run

22
00:00:53,029 --> 00:00:50,399
what their hypotheses are how they plan

23
00:00:55,029 --> 00:00:53,039
to test those hypotheses ideally we

24
00:00:56,709 --> 00:00:55,039
would be brought into that that team

25
00:00:58,950 --> 00:00:56,719
early on

26
00:01:00,869 --> 00:00:58,960
because in addition to the statistics

27
00:01:02,790 --> 00:01:00,879
and an integral part of of the

28
00:01:04,950 --> 00:01:02,800
statistics that will be run

29
00:01:06,950 --> 00:01:04,960
at the study's completion

30
00:01:09,190 --> 00:01:06,960
is the experimental design itself and

31
00:01:12,149 --> 00:01:09,200
often that's when we can really provide

32
00:01:14,149 --> 00:01:12,159
the most help it's it's ironic that this

33
00:01:17,429 --> 00:01:14,159
sort of the that we think of statistics

34
00:01:19,990 --> 00:01:17,439
as the last part of a research study

35
00:01:22,469 --> 00:01:20,000
that leads to the final report

36
00:01:25,109 --> 00:01:22,479
but we can be most helpful at the very

37
00:01:26,950 --> 00:01:25,119
beginning planning stages of the study

38
00:01:28,149 --> 00:01:26,960

where we might be able to sort of help

39
00:01:30,950 --> 00:01:28,159
influence

40
00:01:32,950 --> 00:01:30,960
what kinds of data they collect

41
00:01:34,870 --> 00:01:32,960
what kinds of other data that maybe they

42
00:01:37,510 --> 00:01:34,880
hadn't thought of could be important in

43
00:01:39,109 --> 00:01:37,520
the interpreting of their results so we

44
00:01:41,190 --> 00:01:39,119
try to think about all of that and the

45
00:01:44,469 --> 00:01:41,200
experimental design as well

46
00:01:45,510 --> 00:01:44,479
to to plan the very best study that we

47
00:01:47,830 --> 00:01:45,520
think

48
00:01:50,870 --> 00:01:47,840
can be done and so we need to make the

49
00:01:52,710 --> 00:01:50,880
absolute best out of every piece of data

50
00:01:54,870 --> 00:01:52,720
we can get

51
00:01:57,030 --> 00:01:54,880
is it surprising to you how

52
00:01:59,030 --> 00:01:57,040
space station has evolved now and i i

53
00:02:01,510 --> 00:01:59,040
guess you're probably busier than ever

54
00:02:03,590 --> 00:02:01,520
yeah um as as we're in full utilization

55
00:02:05,510 --> 00:02:03,600
yeah it's incredible right because

56
00:02:07,350 --> 00:02:05,520
you know we're full utilization now

57
00:02:08,869 --> 00:02:07,360
there's a tremendous amount of research

58
00:02:10,309 --> 00:02:08,879
that's going on

59
00:02:11,510 --> 00:02:10,319
i think something

60
00:02:13,430 --> 00:02:11,520
something that a lot of people don't

61
00:02:15,030 --> 00:02:13,440
recognize is that you know the the

62
00:02:16,630 --> 00:02:15,040
astronauts are

63
00:02:18,470 --> 00:02:16,640

they serve two roles right there are

64
00:02:20,470 --> 00:02:18,480
research technicians they're an

65
00:02:22,949 --> 00:02:20,480
extension of the principal investigator

66
00:02:24,229 --> 00:02:22,959
but they're also for the human side of

67
00:02:26,470 --> 00:02:24,239
of the research enterprise they're

68
00:02:28,630 --> 00:02:26,480
they're the experimental subjects too

69
00:02:30,949 --> 00:02:28,640
and there are so many studies that are

70
00:02:32,070 --> 00:02:30,959
that are important and they're all uh

71
00:02:33,350 --> 00:02:32,080
they're all important and they're all

72
00:02:35,509 --> 00:02:33,360
being flown

73
00:02:37,509 --> 00:02:35,519
but there's only so much time that an

74
00:02:39,589 --> 00:02:37,519
astronaut can give

75
00:02:42,470 --> 00:02:39,599
and they participate in as many

76
00:02:44,790 --> 00:02:42,480
experiments as they possibly can but but

77
00:02:46,949 --> 00:02:44,800
their time is really really valuable so

78
00:02:48,790 --> 00:02:46,959
so sample sizes unfortunately aren't as

79
00:02:51,030 --> 00:02:48,800
big as we'd like them to be there's only

80
00:02:53,110 --> 00:02:51,040
a handful of astronauts or cosmonauts

81
00:02:55,110 --> 00:02:53,120
flying at any given time

82
00:02:57,670 --> 00:02:55,120
they're up there for a long time most of

83
00:03:00,710 --> 00:02:57,680
the experiments involve pre-flight and

84
00:03:02,630 --> 00:03:00,720
in-flight and post-flight dimensions to

85
00:03:03,589 --> 00:03:02,640
them so it takes years to complete the

86
00:03:05,350 --> 00:03:03,599
study

87
00:03:07,670 --> 00:03:05,360
so yeah we have to be really lean and

88
00:03:09,509 --> 00:03:07,680

mean when it comes to sample size and

89
00:03:11,270 --> 00:03:09,519
and really crisp clean experimental

90
00:03:12,630 --> 00:03:11,280
designs

91
00:03:14,550 --> 00:03:12,640
do you want to talk about some of the

92
00:03:16,550 --> 00:03:14,560
successes you've seen i mean can you

93
00:03:17,430 --> 00:03:16,560
talk specifically about something yeah

94
00:03:18,710 --> 00:03:17,440
um

95
00:03:21,030 --> 00:03:18,720
you know we've

96
00:03:22,470 --> 00:03:21,040
we've come a long way in the hrp program

97
00:03:24,789 --> 00:03:22,480
even just in the in the period of time

98
00:03:26,949 --> 00:03:24,799
that i've been involved with nasa i

99
00:03:28,789 --> 00:03:26,959
think we're getting smarter you know we

100
00:03:30,070 --> 00:03:28,799
we recognize that there are in terms of

101
00:03:32,149 --> 00:03:30,080
human research there are some things

102
00:03:34,789 --> 00:03:32,159
that we just can't change we'd love to

103
00:03:37,830 --> 00:03:34,799
have a dozen space stations flying

104
00:03:39,430 --> 00:03:37,840
around each with a dozen or more human

105
00:03:41,270 --> 00:03:39,440
astronauts that can help us with our

106
00:03:43,430 --> 00:03:41,280
research but the fact is we got one

107
00:03:45,110 --> 00:03:43,440
space station with a handful of subjects

108
00:03:46,789 --> 00:03:45,120
so we've gotten really smart about how

109
00:03:48,390 --> 00:03:46,799
to use their data

110
00:03:50,309 --> 00:03:48,400
we do a lot more in terms of

111
00:03:52,070 --> 00:03:50,319
standardized measurements and we try to

112
00:03:53,830 --> 00:03:52,080
communicate with all of our investigator

113
00:03:55,750 --> 00:03:53,840

teams that hey these are things that we

114
00:03:57,350 --> 00:03:55,760
collect on astronauts all the time try

115
00:03:59,030 --> 00:03:57,360
to work these in if they're relevant and

116
00:04:01,509 --> 00:03:59,040
we've kind of tried to

117
00:04:03,830 --> 00:04:01,519
hone in and fine-tune those but i think

118
00:04:05,830 --> 00:04:03,840
that the the other aspect that i'm proud

119
00:04:07,589 --> 00:04:05,840
about is that um

120
00:04:09,750 --> 00:04:07,599
that that the people like me like

121
00:04:11,750 --> 00:04:09,760
biostatisticians are involved with the

122
00:04:13,429 --> 00:04:11,760
researchers in lots of different labs to

123
00:04:15,270 --> 00:04:13,439
try to have a better sort of team

124
00:04:17,110 --> 00:04:15,280
approach so we can all bring our

125
00:04:20,390 --> 00:04:17,120
collective expertise in making that

126
00:04:22,310 --> 00:04:20,400
research possible stuff with with small

127
00:04:24,150 --> 00:04:22,320
and is is a particular struggle that i

128
00:04:26,469 --> 00:04:24,160
have and i can bring some expertise to

129
00:04:28,230 --> 00:04:26,479
that that may be a principal

130
00:04:30,629 --> 00:04:28,240
investigator in the neuro lab or the

131
00:04:32,790 --> 00:04:30,639
cardio lab or the muscle exercise lab

132
00:04:34,950 --> 00:04:32,800
maybe they don't know that expertise in

133
00:04:36,550 --> 00:04:34,960
particular but when we when we team up

134
00:04:37,909 --> 00:04:36,560
and we work together i think i think we

135
00:04:41,590 --> 00:04:37,919
have a much better

136
00:04:43,510 --> 00:04:41,600
outcome so yeah we are learning a lot

137
00:04:45,830 --> 00:04:43,520
in all these different disciplines it's

138
00:04:48,310 --> 00:04:45,840

a slow process but uh but it's very

139
00:04:49,670 --> 00:04:48,320
deliberate it's very planned and i think

140
00:04:52,310 --> 00:04:49,680
it's you know we're starting to come up

141
00:04:54,790 --> 00:04:52,320
with uh some some interesting results

142
00:04:56,790 --> 00:04:54,800
uh science is science right so this will

143
00:04:58,870 --> 00:04:56,800
always be pushing the next boundary but

144
00:05:01,029 --> 00:04:58,880
i do think that the human research

145
00:05:02,870 --> 00:05:01,039
program is is getting answers

146
00:05:04,310 --> 00:05:02,880
um so it'll take a while before they

147
00:05:06,469 --> 00:05:04,320
have all the answers that they need i

148
00:05:08,150 --> 00:05:06,479
think and we may never actually get all

149
00:05:09,590 --> 00:05:08,160
the answers we want

150
00:05:11,510 --> 00:05:09,600
but i think we're chipping away at those

151
00:05:13,029 --> 00:05:11,520
really critical questions for for