For the final unit of this course, we're going to talk about how to reach broader audiences,,either by talking with the media or by writing about science for the general public.,After you have published some papers, you may be contacted by journalists who are interested in your work.,I encourage you to share your work with the media so that it can reach a larger audience.,In this module, I'll give you some tips for talking with the media.,I'm a science journalist, so I interview a lot of scientists.,I'm going to give you some tips from the interviewer's perspective.,1st of all, what are journalists looking for?,When I'm interviewing a scientist, I obviously want to understand the science.,So if there's anything I need clarified about the science, I'm going to ask that.,But most times, I already have a good concept of the science.,What I'm after in the interview are things that help with the story in context, give it a human dimension and make it relatable to non scientists.,I'm hoping that the scientists can tell me what they think is the big picture significance of the work, the taco message.,I also want to know how the research affects people.,For stories about basic laboratory research, it's nice if you can tell the journalist how your work could potentially affect people, even in the long term.,Also, journalists have to write about new things.,They have to have a news hook.,There's some reason why the story is being written about Now, if you can tell a journalist what's different,, or knew about your results, what distinguishes it from previous studies, that's very helpful.,Journalists are looking for descriptive, engaging language.,So if you give me colorful prose metaphors, descriptions, something controversial or lively, or something that has some bite to it, I'm likely going to quote you on that.,Make sure that if you are going to say something controversial or biting, you don't mind being quoted on it.,Interesting stories or anecdotes like how you came up with the idea for the study, are often great. Anything that's surprising or paradoxical or ironical.,Journalists love that because that makes the story compelling.,If you were trying to make a weight loss drug and it turned out that it worked better as a cancer drug, that's an interesting story that you might want to share with the journalist.,Journalists are also looking for people focus stories for longer feature stories.,I may ask you things like, what motivates you and what keeps you up at night?,Because I want to bring a human dimension into the story.,Researchers are people too, and readers want to read about people.,It's nice to give some historical facts or something about the development of the idea.,Journalists also need a 1st quote for their story.,If it's a story focused on a single study, a sweeping comment about the significance of the work makes a great 1st quote.,So try to have a statement prepared that clearly and concisely says why the work is important.,Finally, you may be interviewed as a commentator on a peer research if they have space.,Journalists try to include an outside perspective on the work.,If you point out the controversies, or you give very bold criticisms or lotatory praise, that's likely to make it into the article.,So just be careful about that.,Remember, journalists are looking to be able to quote you directly.,This means you need to speak clearly and concisely and in lay person terms.,If your language is too complicated or full of jargon or boring, they will have nothing to quote you on.,So be prepared. It may help to craft a few take home messages ahead of time and write these down.,Make sure they're clear and easy to understand in the active voice, without too much clutter or jargon.,You can read these to the journalist, and that's what you at may end up being quoted on.,It helps to pretend that you are talking to an intelligent relative or friend who isn't a scientist.,You may want a picture your uncle, or your grandmother or your grandfather, somebody that you might be explaining your science to over the dinner table who's not a scientist themselves. Make sure you give the journalist clear take home messages.,Don't be wishy washy about what the findings mean.,State clearly what you think the journalists should focus on in their peace.,Try to anticipate any confusions or misinterpretations that the journalist or the lay public might make about your work.,Especially if it's something controversial, you can say to the journalist, here's something that people might misunderstand about my work, and let me tell you why that's wrong.,Also, make sure to give a clear statement of the key limitations of your work.,The journalist might not ask for that, but it helps the journalists to put your research in context.,It keeps them from overblowing or overstating,the findings. Finally, think carefully about how you present numbers to the journalist or any general audience.,e.g., most people understand one out of 100 better than they understand 1 %.,And most people don't have a good sense of what say a nanometer is.,So if you use the term nanometer, you need to say how small that is, if possible, compare it to something people are familiar with.,So you might say a nanometer is 1000000000th of a meter, and the width of a single human hair is about 80000 nm, or the thickness of a sheet of paper is about 100000 nm.,It gives people something concrete to understand.,Because I think this is so important, I'm going to go into more detail on explaining risk to journalists in the way public.,If you're talking about risks, make sure you present those risks in the most transparen't easy to understand way that you can.,People are bad at understanding risk.,We tend to be very frightened of things that have a low probability of occurring, whereas we are not adequately frightened about things that occur more commonly.,So we read about terrorist attacks, which occur with an extremely low probability, ,but we ignore the risk of heart attacks, which are way more likely to kill you, even if you're young and healthy.,Presenting risks in a way that's easy to understand is a great public service. A couple of principles to keep in mind wherever possible, prefer whole numbers to fractions or percents, say ten and 100, rather than 10 %.,Also, wherever possible, opt to present absolute risks rather than relative risks.,Relative risk can be misleading. E.g., if an exposure increases your risk of cancer from one in 10000 to two in 10000, you can call this a doubling of risk.,But you better also give the absolute values as well, so that the reader understands that the absolute increase in risk is just one in 10000.,I want to share a case study with you.,This is a case where the researchers of the study and the people who put out the press release did an excellent job of describing the risks.,I was working as a journalist at the time, and when the press release came across my desk, I was so impressed that they had thought carefully about the way to present the numbers.,They used absolute risks and whole numbers.,The study was the women's Health Initiative.,This was a large, randomized, double blind study where they were treating a postmenopausal women, either with postmenopausal hormones or with a placebo pill.,At the time the study was started, in 1990s, it was taken for granted that postmenopausal hormones reduced heart disease in women.,That was the dogma of the time, but it had never been proven in a randomized trial.,In 2002, the researchers of the trial did an interim data analysis where it became clear that, in fact, the dogma was wrong.,In this study, the women who had been put on hormones had a significantly increased risk of both breast cancer and heart disease.,It became clear, part way through the study that the risks of hormones were outweighing the benefits, so they stopped the trial early.,At the time they stopped the trial, 14 million postmenopausal women in the U-S were taking hormones.,The results were a bomb shell, so the researchers had to be very careful about not scaring 14 million women.,The researchers published the results in jama at the same time that they halted the trial, and it was widely covered by the media. In the jam of paper, the researchers presented the result in multiple ways.,Okay? One of the numbers in the jam of paper was the relative risks, the relative risk comparing hormones to placebo for breast cancer was 1.26 and for heart disease was 1.29.,what those mean is that women who take hormones have a 26% increased risk of breast cancer compared with women who take placebo and a 29% increased risk of heart disease.,But is that the best way to present the numbers for the lay public?,Those numbers sound very dramatic. They sound frightening.,That sounds like a big increase in risk.,If the press release had focused on those, im sure that the media would have focused on those numbers and what as well.,But the paper also looked at the numbers in a different way.,They presented the numbers in terms of absolute risks.,The rate of invasive breast cancer was .3% in the placebo group, versus .8% in the hormones group.,The risk increase there is only percent per year.,And similarly, for heart disease, the risk increase was .7% per year.,I'll just note for those of you who are paying attention to the math here, that if you divide .38% by .3 %,, that gives you roughly the relative risk, but it's not exactly 1.26, because slightly different models were used to generate the relative risks than the absolute risk.,So if you notice that they don't exactly line up, that's why, when you hear the numbers presented this way, it's clear that the risk to any one individual woman is actually quite small.,When 14 million women are taking hormones, an increase in risk of .07% or .8% translates to lots of cases of heart disease and breast cancer.,But for any individual woman within that 14 million, her personal risk is not increased by very much.,As I mentioned, most people are not adept at thinking in percents and fractions, so we can do even better by translating those percents into whole numbers.,In the press release from the women's Health Initiative, they stated that the risk of breast cancer was increased from 30 cases per 100000 per year, 02:38 per oh sorry, 38 per 10000. That was a eight case per 10000 increase.,Those are numbers that most people can understand.,Similarly, for heart disease, there was a seven person, seven case increase per 10000 women years.,That's the way the numbers were presented in the press release, and that's the way the numbers were presented in the media coverage of this study.,So which is the best way to present, uh, the numbers for the public?,I'd argue that the absolute risks and whole numbers are much more transparen't the relative risks obscure?,The fact that the baseline risk here is quite small, the relative risks are needlessly scary and shocking.,I was impressed that whoever drafted the press release from the women's Health Initiative was thinking very carefully about numbers.,Again, they presented the 2nd way here, the more in more cases per And guess what?,All the major media outlets that covered the story presented those numbers.,Most did not even report the relative risks.,This case study goes to show you that as a researcher, you have a lot of control over the numbers that the press focuses on.,If you give journalists the right numbers, the most transparen't numbers, those are the numbers that will likely appear in their stories.,If you don't help them with the numbers, they're likely to just report the most dramatic numbers from your paper.

在本课程的最后一个单元中，我们将讨论如何通过与媒体交谈或为公众撰写有关科学的文章来吸引更广泛的受众。在您发表了一些论文后，可能会有对您的工作感兴趣的记者与您联系。我鼓励你与媒体分享你的作品，这样它就可以吸引更多的受众。在本模块中，我将为您提供一些与媒体交谈的技巧。我是一名科学记者，所以我采访了很多科学家。我将从面试者的角度给你一些建议。首先，记者在寻找什么？当我采访一位科学家时，我显然想了解这门科学。因此，如果我需要澄清一些关于科学的内容，我会问这个问题。但是大多数时候我已经对科学有了很好的概念。我在采访中追求的是有助于将故事置于上下文中、赋予其人文维度并使其与非科学家相关的东西。我希望科学家们能告诉我他们认为这项工作的大局意义，即带回家的信息。我还想知道这项研究如何影响人们。了解有关基础实验室研究的故事。如果你能告诉记者，即使从长远来看，你的工作也可能如何影响人们，那就太好了。记者也必须写关于新事物的文章。他们必须有新闻挂钩。现在写这个故事是有原因的。如果你能告诉记者你的研究结果有什么不同或新之处，那么它与以前的研究有什么区别，那将非常有帮助。记者们正在寻找描述性的引人入胜的语言。因此，如果你给我一些丰富多彩的散文、隐喻、描述、有争议或生动的东西，或者一些有影响力的东西，我很可能会引用你的话。如果你要说一些有争议的话或尖刻的话，一定不要介意在上面被引用。有趣的故事或轶事，比如你是如何想出这项研究的想法的，通常都很棒。任何令人惊讶、自相矛盾或讽刺的记者都喜欢这一点，因为这使故事引人入胜。如果你想制造一种减肥药物，但事实证明它作为抗癌药物效果更好，那么这是一个有趣的故事，你可能想和记者分享。记者们也在寻找以人为本的报道。对于较长的专题报道，我可能会问你一些问题，比如什么激励了你，是什么让你彻夜难眠，因为我想将人文维度带入故事中。研究人员也是人，读者想阅读有关人的信息。提供一些历史事实或一些关于这个想法发展的东西真是太好了。记者的报道还需要一句第一句话。如果这是一个以单一研究为重点的故事，那么对这部作品的重要性的笼统评论就是一句很好的第一句话。因此，尽量准备一份声明，清晰简洁地说明为什么这项工作很重要。最后，你可能会以评论员的身份接受同行研究的采访。如果他们有空间，记者就会尽量从外部角度看待工作。如果你指出争议，或者你得到非常大胆的批评或赞美的赞美，那很可能会出现在文章中。所以要小心一点。请记住，记者希望能够直接引用你的话。这意味着你需要用外行的术语清晰、简洁地说话。如果你的语言太复杂、充满行话或无聊，他们就没什么好引用你的。所以要做好准备。提前制作一些带回家的消息并将其写下来可能会有所帮助。确保它们在活跃的语音中清晰易懂，没有太多的混乱或行话。你可以把这些读给记者，这就是你最终可能会被引用的内容。假装你在和一个不是科学家的聪明亲戚或朋友交谈会有所帮助。你可能想象一下你的叔叔、祖母或祖父一个你可能在餐桌旁向自己不是科学家的人解释你的科学。一定要给记者明确的带回家信息。不要对这些发现的含义一厢情愿。明确说明你认为记者在文章中应该关注的内容。尽量预测记者或非专业公众可能对你的作品产生的任何困惑或误解，尤其是在有争议的情况下。你可以对记者说，人们可能会误解我的作品，让我告诉你为什么会这样做。另外，请务必明确说明您的工作的主要局限性。记者可能不会要求这样做，但它可以帮助记者将你的研究置于上下文中。它可以防止他们夸大或夸大调查结果。最后，请仔细考虑如何向记者或任何普通受众展示数字。并非每个人都对数字感到满意，因此考虑以最透明的方式呈现数字对您来说很重要。例如，大多数人对100分之一的理解要比他们理解的百分之一好。而且大多数人对所说的纳米含义不太了解。因此，如果你使用纳米这个词，你需要说出它有多小。如果可能的话，将其与人们熟悉的东西进行比较。因此，你可以说一纳米等于十亿分之一米，一根人类头发的宽度约为8万纳米，或者一张纸的厚度约为100,000纳米。它为人们提供了一些需要理解的具体内容。因为我认为这非常重要。我将更详细地介绍向记者和非专业公众解释风险。如果你在谈论风险，一定要尽你所能以最透明、最容易理解的方式呈现这些风险。人们不善于理解风险。我们往往对发生概率较低的事情感到非常恐惧，而对更常见的事情却没有足够的恐惧。因此，我们担心恐怖袭击发生的可能性极低，但我们忽略了心脏病发作的风险，即使你年轻、健康，心脏病发作也更有可能杀死你。以@@易于理解的方式呈现风险是一项很好的公共服务。只要有可能，要记住几个原则更喜欢整数而不是分数，或者百分比表示百分之十而不是百分之十。此外，只要有可能，选择呈现绝对风险而不是相对风险，相对风险可能会产生误导。例如，如果暴露使你患癌症的风险从万分之一增加到万分之二，你可以称之为风险的两倍，但你最好也给出绝对值，这样读者才能明白，风险的绝对增加仅为万分之一。我想和大家分享一个案例研究。在这种情况下，该研究的研究人员和发布新闻稿的人在描述风险方面做得非常出色。当时我是一名记者，当新闻稿传到我的办公桌上时。给@@我留下了深刻的印象，以至于他们仔细考虑了数字的呈现方式。他们使用了绝对风险和整数。该研究是《妇女健康倡议》。这是一项大型的随机、双盲研究，他们用绝经后激素或安慰剂药丸治疗绝经后女性。在20世纪90年代这项研究开始时，人们理所当然地认为绝经后的激素可以减少女性的心脏病。那是当时的教条，但从未在随机试验中得到证实。2002年，该试验的研究人员进行了临时数据分析，发现教条实际上是错误的。在这项研究中，服用过激素的女性患乳腺癌和心脏病的风险显著增加。在这项研究的中途，很明显，激素的风险大于益处，因此他们提早停止了试验。当他们停止试验时，美国有1400万绝经后女性正在服用激素。结果简直是重磅炸弹。因此，研究人员必须非常小心，不要吓到1400万女性。研究人员在JAMA上发表了研究结果，同时他们停止了试验，并被媒体广泛报道。在JAMA的论文中，研究人员以多种方式介绍了结果。好吗？JAMA论文中的数字之一是相对风险。乳腺癌的激素与安慰剂比较的相对风险为1.26，心脏病的相对风险为1.29。你的解释是，与服用安慰剂的女性相比，服用激素的女性患乳腺癌的风险增加了26％，患心脏病的风险增加了29％。但这是向非专业公众展示数字的最佳方式吗？这些数字听起来非常戏剧性，听起来很吓人。这听起来像是风险大幅增加。如果新闻稿侧重于这些数字，我敢肯定，媒体也会关注这些数字。但是报纸也以不同的方式看待这些数字。他们按绝对风险列出了这些数字。安慰剂组浸润性乳腺癌的发病率为0.30％，而激素组的浸润性乳腺癌发病率为0.38％。那里的风险每年仅增加0.08％。同样，心脏病的风险每年增加0.07％。对于那些关注这里数学运算的人，我只想注意，如果你将.38％除以0.30％，则可以得出大致的相对风险，但并不完全是1.26，因为生成相对风险的模型与绝对风险略有不同。因此，如果您发现它们不完全排队，这就是原因。当你听到以这种方式呈现的数字时，很明显，任何一个女性面临的风险实际上都很小。当1400万女性服用激素时，0.07％或0.08％的风险会增加许多心脏病和乳腺癌病例。但是，对于这1400万以内的任何一个女性来说，她的人身风险并没有增加太多。正如我所提到的，大多数人不擅长用百分比和分数来思考。因此，通过将这些百分比转换为整数，我们可以做得更好。在妇女健康倡议的新闻稿中，他们指出，患乳腺癌的风险从每年每10万人中有30例增加到每10,000人中有38例。也就是说，每增加1万例就有8例病例。这些是大多数人都能理解的数字。同样，在心脏病方面，每年每10,000名女性中增加7例病例。这就是新闻稿中数字的呈现方式，也是媒体对这项研究的报道中数字的呈现方式。因此，我认为这是向公众展示数字的最佳方式，我认为绝对风险和整数要透明得多。相对风险掩盖了这样一个事实，即这里的基线风险很小。相对的风险不必要地令人恐惧和震惊。无论谁起草了妇女健康倡议的新闻稿，都非常仔细地考虑了数字，这给我留下了深刻的印象。他们再次以第二种方式呈现了每10,000例中另外8例和7例的案例。猜猜所有报道这个故事的主要媒体都提供了这些数字。大多数人甚至没有报告相对风险。这个案例研究向你表明，作为一名研究人员，如果你给记者正确的数字，你就能很好地控制媒体关注的数字。最透明的数字是他们故事中可能出现的数字。如果你不帮助他们计算数字，他们很可能会报道你报纸上最引人注目的数字。因此，请仔细考虑风险的呈现，并在与记者交谈时尽量将事情置于绝对风险和整数中。