

# **Ethics of Radiological Protection in Public Communications - Is Telling the Truth the Answer?\***

**Ray Johnson, MS. PSE. PE, DAAHP, FHPS, CHP**  
**Radiation Safety Counseling Institute**  
**16440 Emory Lane**  
**Rockville, MD 20853**  
[ray@radiationcounseling.org](mailto:ray@radiationcounseling.org)

In 1985 I was invited to give a presentation on radiation risk communication at a conference of the American Chemical Society. Before my presentation, the moderator (a well known health physicist) approached me and said, “So, you are going to tell us the answer to radiation risk communication?” I replied, “I do not pretend to have all of the answers, but I hope to offer some helpful insights.” Hearing this he responded, while shaking his finger in my face for emphasis, “The answer to public communications is simple, just tell people the truth!” I replied to say, “I agree that telling the truth is very important, however, my studies with the Meyers-Briggs Type Indicator (MBTI – trademark of Consulting Psychologists Press) show that truth has a different meaning to different people. After hearing a brief explanation of insights from the MBTI, he left in great disgust saying, “I can see that we are diametrically opposed.” Apparently “truth” had a special meaning for this person and he was not willing to hear other views.

My MBTI studies with over 4,000 specialists in radiation safety show that, for the majority of these people, truth is what can be defended by logical analysis based on fundamental laws and principles and corroborated by peers according to the scientific method for determining the technical truth. However, for the majority of the general public, truth is determined by what is best for people taking into account the circumstances, feelings, empathy, values, appreciation, and caring. These two approaches to determining the truth may lead to very different conclusions. While these two views of the truth can be poles apart, both groups will honestly believe they are right and will swear they are telling the truth.

## **Is Telling the Truth Working?**

In light of these MBTI insights, the question now is whether telling the “technical truth” about radiation is working for proponents of radiation safety? Have extreme public fears of radiation been abated by attempts to provide better technical information? Have public sentiments against radiation mellowed over the decades since the advent of nuclear weapons and nuclear power? I believe most will agree that the public is as concerned about radiation safety today as decades

- 
- Published January 2015 in Redaktionsplan Schwerpunktthema, Strahlenschutz PRAXIS Heft 4/2014 – Submitted 24.07.2014 at the request of Dr. Renate Czarwinski, President of the International Radiation Protection Association.

ago. After all, we now have proof that nuclear technology can go wrong (Three Mile Island, Chernobyl, and now Fukushima Dai-ichi). Apparently, the technical truth which specialists in radiation safety have been telling the public is not generally accepted. This leads to the question, “If telling the technical truth is NOT the answer, should we forego telling the truth?” What is the answer for public communications? Can we ever hope the public will achieve a balanced understanding of radiation risks closer to the technical understanding of experts?

### **What is the Truth?**

Before we can answer the question about telling the truth, we first have to define the meaning of “truth.” There are several theories about what determines the truth. Scientists typically believe truth is determined by logical patterns of reasoning. Mathematicians believe truth is provable within an axiomatic system. Most accept that truth is that which is in accord with fact or reality or fidelity to an original, standard, or ideal. Some believe that truth is derived from social processes and perceptions. Consensus theory says truth is what we agree upon, such as the basis for radiation measurements and calibration in comparison with an agreed upon standard.

### **Truth and Ethics**

The moral principles of ethics dictate that we should tell the truth to the extent that we understand the meaning of truth. This invites the question, “Are we morally ethical in our public communications about radiation risks? Is there a right and wrong way to tell people about radiation? Should we just present the facts? If so, what are the true facts? Can we justify simplifying technical information to enhance understanding. Which is more important, technical accuracy or compassion and understanding? Which approach can we defend? What is professionally or ethically acceptable?

### **Ethics and Lying**

Most will agree that purposely not telling the truth (lying) is unacceptable. In a courtroom we swear an oath to tell the truth, the whole truth, and nothing but the truth. We can be charged with perjury if caught making a false statement under this oath. What about telling a half truth or an exaggeration, is that the same as lying? Falsifying information will result in penalties by radiation safety regulators. What if we honestly say what we believe without knowing that it is not technically true? Technical specialists are constantly dismayed about widespread acceptance of “radiation mythology” or common beliefs about radiation that are not technically true. Is the perpetuation of radiation myths by the media unethical or lying?

### **The Importance of Truth and Faith**

We have to believe (have faith) in something. Truth is needed for survival and coping with the world. We need realistic expectations to live. By faith we lead active lives aligned with ideals and beliefs in what is true. The question is, “How do we assess or determine meaning and truth?” In 1900 H.G. Wells stated that, “A fact is a synthesis of impressions.” Current studies of how our minds process data indicate that Wells was about 100 years ahead of his time.

## **How We Determine the Truth**

We process, sort, compare, categorize, and analyze information in relation to our immediate circumstances, experiences, and life factors such as health, wealth, traditions, and lifestyles to determine meaning and truth. The initial processing of data is done subconsciously by the computer that runs the machine called our body. This processing occurs continuously and instantaneously. Our subconscious mind is also programmed to be constantly on the alert for any signs of danger. Instant automatic responses are crucial for our survival. When alerted our subconscious immediately triggers a fight or flight response.. Do we really want to take the time for our rational conscious mind to evaluate whether a snake in the grass looks angry or should we instinctively jump back.

## **Role of Our Subconscious Mind**

The automatic processes of our subconscious mind influence our conscious awareness of the world in fundamental ways, such as how we view ourselves and others. It influences the meanings and truths that we attach to everyday events in our lives. It affects the actions we take in response to our instinctive experiences of the world. To conserve energy our conscious mind will usually accept the instant processing of our subconscious mind. While quick responses are crucial for survival, when based on limited and unevaluated information, such responses may not be best in the long run.

## **Fears of Radiation are Involuntary**

Everyone has an instinctive fear of snakes, heights, spiders, closed spaces, submersion, and public speaking. Because of the often repeated message of “deadly radiation” those words have now become embedded in our subconscious mind as the basis for meaning and truth of radiation. For many people radiation is now an instinctive source of fear and no longer a conscious choice. When alerted to radiation (such as a screaming Geiger counter) our subconscious reacts without consulting our rational conscious mind. Thus the decision to “RUN” is now automatic. As a result, our best efforts to present scientifically factual data about radiation may not change the perceived truth that radiation is always to be avoided.

## **Ethical Answers to Public Communication**

Specialists in radiation safety can serve as a resource to help people find the “truth” about radiation. We can begin by letting people know that it is OK to be afraid of radiation. We should not make people wrong for their fears. We can use “Active Listening” to show that we care by hearing and reflecting feelings. We can help people find their own answers, such as showing them how to make their own radiation measurements. We can help people answer their questions about radiation safety by showing them the steps from cause to effect.

## **Steps from “Cause to Effect”**

A technical specialist will go through the following steps or questions to determine the truth about radiation safety.

1. What are the properties of the radiation? Type, form, and quantity.
2. Where is the radiation located? Distance is a powerful way to reduce exposure.
3. How is the radiation or materials contained? Shielding reduces exposures.
4. What are the exposure conditions, internal or external – mSv / hour?
5. What is the duration of the exposure – hours?
6. How much radiation energy is deposited in our body – mSv?
7. What are possible health risks at 1 death per 10 person-Sv (according to the National Research Council, BEIR VII).

### **Ethics and Truth in Public Communications**

While we can agree that it is ethically important to tell the “truth” about radiation, we also now see that truth may have different meanings. Even when evaluating the same information, people may arrive at very different conclusions on the meaning. Radiation safety specialists may prefer logical analysis for determining the truth, however, most of the public may prefer to take into account feelings and circumstances. While the subconscious minds of many people are programmed to fear radiation by the words “deadly radiation,” specialists in radiation safety can serve as a resource to help people determine their own truths by acknowledging their fears and leading them through the scientific process of steps from cause to effect.

### **References**

1. How Risky is it Really, David Ropeik, 2010
2. Thinking, Fast and Slow, Daniel Kahneman, 2011
3. Subliminal – How Your Subconscious Mind Rules Your Behavior, Leonard Mlodinow, 2012
4. How We Make Decisions for Radiation Safety and are Prone to Errors, Ray Johnson, a series of monthly columns in the Health Physics Society Newsletter, 2012-2013
5. Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII, National Research Council of the National Academies, June 2005.



Ray Johnson, MS, PSE, PE, FHPS, CHP, is a 50 year career specialist in radiation safety. He currently directs the Radiation Safety Counseling Institute where he provides consulting, training, and counseling on issues involving radiation safety. He specializes in radiation instruments, nuclear gauges, industrial x-ray, NORM, and radiation risk communication. He has trained over 3,000 radiation safety officers. He is a past president of the Health Physics Society and the American Academy of Health Physics and has over 500 publications and presentations on radiation safety.

Radiation Safety Counseling Institute

16440 Emory Lane

Rockville, MD 20853

301-370-8573

[ray@radiationcounseling.org](mailto:ray@radiationcounseling.org)