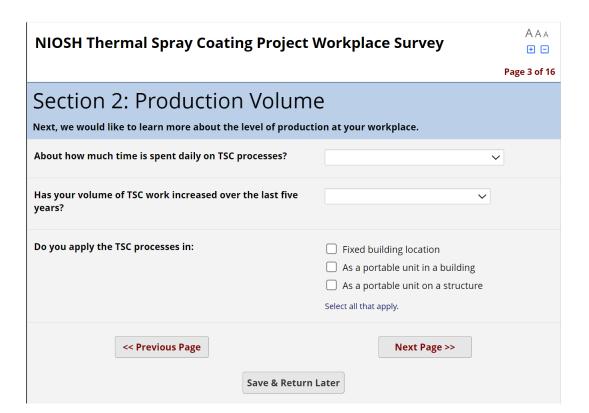
AAA **NIOSH Thermal Spray Coating Project Workplace Survey** + -Page 1 of 16 Thank you for your participation and taking time to answer questions about your workplace. The purpose of this survey is to help the National Institute for Occupational Safety and Health (NIOSH) better understand the thermal spray coating industry and best practices or barriers to occupational safety and health. NIOSH is a federal public health research agency. NIOSH is not part of the Occupational Health and Safety Administration (OSHA) and does not fine companies for health and safety violations. The estimated time to complete this survey is 10-30 minutes. Does your workplace work in thermal spray coating (TSC), Yes [continue] including electric arc, flame, high velocity oxyfuel (HVOF), O No [thank you, please exit survey] conventional plasma, high energy plasma, vacuum plasma, radio frequency plasma, detonation gun, cold spray, or O I'm not sure [continue] other? reset * must provide value Next Page >> Save & Return Later

NIOSH Thermal Spray Coating Project Workplace Survey



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Section 1: Workplace Information First, we would like to learn more about your workplace.		
Name of Company		
Company Address		
Industry Classification (Name/NAICS Code-6-digit)		
About how many people work at this company (including contractors)?		
About how many workers perform thermal spray coating?		
About how many other workers perform tasks related to TSC, such as maintenance, pre-surface preparation, post surface cleaning, or finishing?		
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Section 3A: Production Practices (TSC Processes)

Next, we would like to learn more about the TSC processes and materials, tasks performed, engineering controls, and safety measures your workplace uses. Over the next few questions, you will be asked to provide the following information for each TSC process currently used at your workplace:

 Feedstock material Amount used annually Feedstock form (e.g., powder; wire/rod; liquid suspension/liquid precursor) Fuel, propellants, substrate materials Structures description of booths or enclosures Control technologies Personal protective equipment (PPE) Housekeeping 			
Do you use the electric arc TSC		YesNoreset	
For the electric arc TSC process metals feedstock material used		✓ Nickel ✓ Chromium Manganese Cobalt Aluminum Zinc Tin Tungsten Molybdenum Iron Copper ✓ Other (please describe) Select all that apply.	
Metal	Indicate amount used annually	Indicate form used (select all that apply)	
Nickel	~	Powder Wire/rod Liquid suspension/liquid precursor	
Metal	Indicate amount used annually	Indicate form used (select all that apply)	
Chromium	~	Powder Wire/rod Liquid suspension/liquid precursor	

Indicate amount used annually	Indicate form used (select all that apply)		
	Powder		
	☐ Wire/rod		
~	Liquid suspension/liquid precursor		
, please select the types of	Stainless steel		
	Mild steel		
	Nickel chromium alloys		
	Nickel and cobalt alloys		
	Ni-Cr-B-Si alloys		
	MCrAIY		
	TiAl		
	Ti3Al		
	Ni3Al		
	NiAl		
	MoS2		
✓	Other (please describe)		
Sele	ect all that apply.		
Indicate amount used annually	Indicate form used (select all that apply)		
	Powder		
~	☐ Wire/rod		
	Liquid suspension/liquid precursor		
·			
Indicate amount used annually	Indicate form used (select all that apply)		
Indicate amount used annually	Indicate form used (select all that apply) Powder		
Indicate amount used annually			
Indicate amount used annually	Powder		
	s, please select the types of stock material used.		

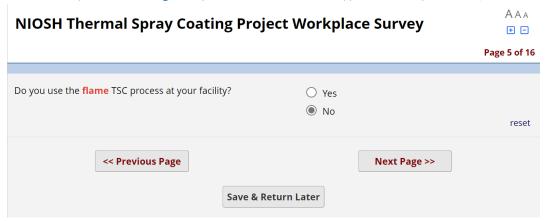
Ceramics	Indicate amount used annually	Indicate form used (select all that apply)
Al2O3	V	Powder Wire/rod Liquid suspension/liquid precursor
Ceramics	Indicate amount used annually	Indicate form used (select all that apply)
Other (please describe)	~	Powder Wire/rod Liquid suspension/liquid precursor
For the electric arc TSC process, please select the types of cermet (ceramics/metals) feedstock materials used. WC/Co Cr3C2/NiCr TiC/NiCr Other (please describe) Select all that apply.		
Cermet	Indicate amount used annually	Indicate form used (select all that apply)
WC/Co	~	Powder Wire/rod Liquid suspension/liquid precursor
Cermet	Indicate amount used annually	Indicate form used (select all that apply)
Other (please describe)	~	Powder Wire/rod Liquid suspension/liquid precursor
For the electric arc TSC process, please select the types of polymers composites feedstock materials used. Light Type of the electric arc TSC process, please select the types of polymers composites feedstock materials used. Light Type of the electric arc TSC process, please select the types of the electric arc TSC process, please select the types of the electric arc TSC process, please select the types of the electric arc TSC process, please select the types of the electric arc TSC process, please select the types of the electric arc TSC process, please select the types of the polyment alcohols Nylon 11 Polytetrafluoroethylene Polyetheretherketone Polymethylmethacrylate Polycarbonate Polycarbonate Polyvinylidene fluoride Other (please describe) Select all that apply.		

Polymers Composites	Indicate amount used annually	Indicate form used (select all that apply)
		Powder
rethanes	~	☐ Wire/rod
		Liquid suspension/liquid precursor
	,	
olymers Composites	Indicate amount used annually	Indicate form used (select all that apply)
Othor (places describe)		Powder
Other (please describe)		☐ Wire/rod
	<u> </u>	Liquid suspension/liquid precursor
	ss, please select the types of fuel	Argon
nd propellants used.	✓	Helium
		Air
		Nitrogen
		Oxygen
		Propane
		Acetylene
		Hydrogen
		Propylene
		Kerosene
		Chemtane 2
		Chemtane 2
		Chemtane 2 Methane
		Chemtane 2 Methane Methylacetylene propadiene propane
		Chemtane 2 Methane Methylacetylene propadiene propane Mixture
other fuel and propellants	Sel	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other
	are used, please specify.	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply.
or the electric arc TSC proce:	are used, please specify.	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply.
or the electric arc TSC proce:	sel are used, please specify.	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum
or the electric arc TSC proce:	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum
or the electric arc TSC proce:	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum Cobalt
or the electric arc TSC proce:	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum Cobalt Copper
or the electric arc TSC proce:	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum Cobalt Copper Nickel Stainless steel
or the electric arc TSC proce:	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum Cobalt Copper Nickel Stainless steel Mild steel
or the electric arc TSC proce:	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum Cobalt Copper Nickel Stainless steel Mild steel Polymer
other fuel and propellants or the electric arc TSC procesubstrate materials used.	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum Cobalt Copper Nickel Stainless steel Mild steel Polymer Iron
or the electric arc TSC proce:	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum Cobalt Copper Nickel Stainless steel Mild steel Polymer Iron Titanium
or the electric arc TSC proce:	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum Cobalt Copper Nickel Stainless steel Mild steel Polymer Iron
r the electric arc TSC proce:	are used, please specify. ss, please select the types of	Chemtane 2 Methane Methylacetylene propadiene propane Mixture Other ect all that apply. Aluminum Cobalt Copper Nickel Stainless steel Mild steel Polymer Iron Titanium

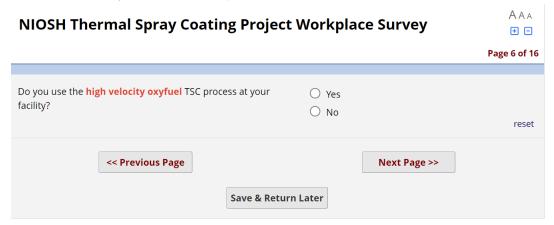
If other substrate materials are used, please specify.	
For the electric arc TSC process, is this TSC process conducted in a temporary containment (e.g., containment using tarps), an enclosed structure (e.g., booths or glovebox), or in a non-enclosed restricted area?	✓ Glove box Field portable glove box Fully enclosed booth Partially enclosed booth Temporary containment No booths Restricted area non-enclosed ✓ Other Select all that apply.
If other types of containment are used, please specify.	
For the electric arc TSC process, please select the types of exhaust ventilation used for this process.	 Mechanical exhaust ventilation Portable exhaust ventilation No mechanical exhaust ventilation Select all that apply.
For the electric arc TSC process, please select the type(s) of mechanical exhaust ventilation used.	 HEPA filter Dry filter Wet scrubber Water curtain ✓ Other Select all that apply.
If other types are used, please specify.	
For the electric arc TSC process, please select the type(s) of portable exhaust ventilation used.	☐ HEPA filter☑ OtherSelect all that apply.
If other types are used, please specify.	
For the electric arc TSC process used, please select the Personal Protective Equipment (PPE) available at your workplace.	 ✓ NIOSH-approved N95 respirator ✓ Half-face respirator ✓ Full-face respirator ✓ Powered air-purifying respirator (PAPR) ✓ Other PPE ✓ Other Select all that apply.
Please describe other PPE available.	

For the half-face respirator, please select type(s) of filter(s) used.	 ✓ Particulate filter ✓ Organic vapor cartridge Combination Unsure Select all that apply.
For the full-face respirator, please select type(s) of filter(s) used.	✓ Particulate filter ✓ Organic vapor cartridge Combination Unsure Select all that apply.
Please select other PPE used.	✓ Gloves ✓ Protective glasses or goggles Coveralls Select all that apply.
For the electric arc TSC process, please select the enclosures and TSC equipment that are cleaned in your workplace.	✓ Glove box ✓ Booth ✓ Temporary containment ✓ Other Select all that apply.
Please describe other type of enclosure or equipment cleaned.	
Glove box: please indicate how often this enclosure or equipment is cleaned.	V
Booth: please indicate how often this enclosure or equipment is cleaned.	~
Temporary containment: please indicate how often this enclosure or equipment is cleaned.	~
Other: please indicate how often this enclosure or equipment is cleaned.	~
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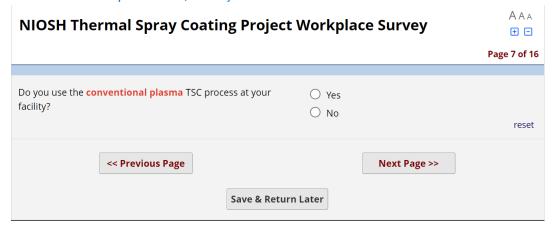
[After completing the group of questions above related to the electric arc TSC process, REDCap will move to the next question, asking if respondents use different type(s) of TSC processes]



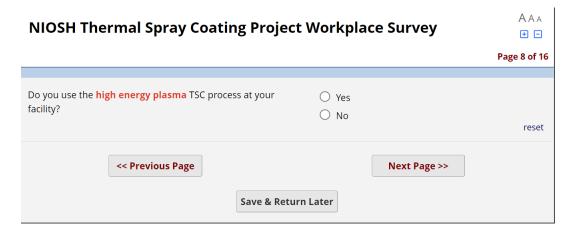
[If the answer is Yes, REDCap will trigger questions 13b - 13w above. If the answer is No, REDCap will move to the next question as follows]



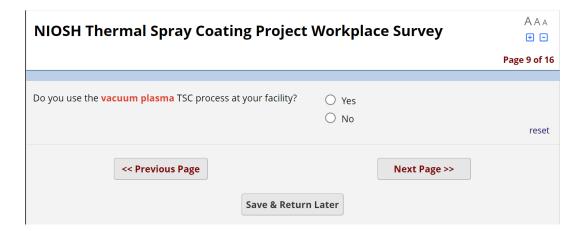
[If the answer is Yes, REDCap will trigger questions 13b - 13w above. If the answer is No, REDCap will move to the next question as follows]



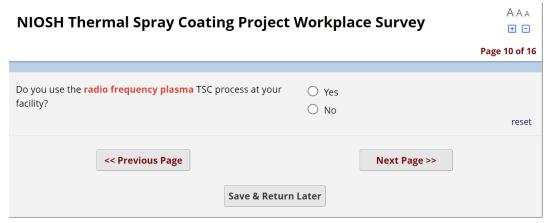
[If the answer is Yes, REDCap will trigger questions 13b - 13w above. If the answer is No, REDCap will move to the next question as follows]



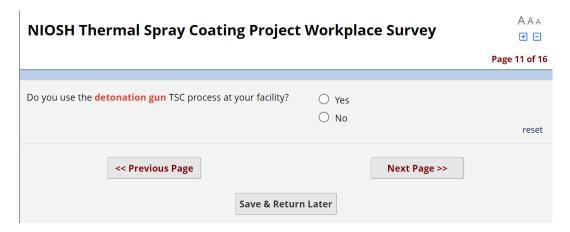
[If the answer is Yes, REDCap will trigger questions 13b - 13w above. If the answer is No, REDCap will move to the next question as follows]



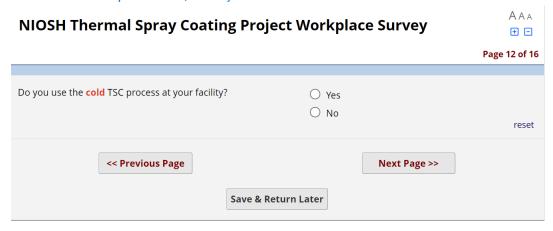
[If the answer is Yes, REDCap will trigger questions 13b - 13w above. If the answer is No, REDCap will move to the next question as follows]



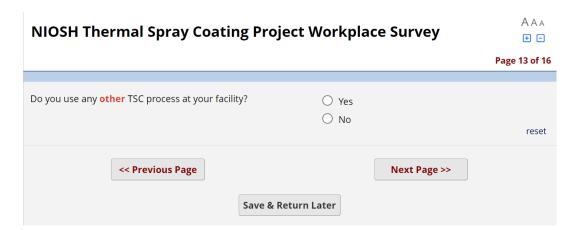
[If the answer is Yes, REDCap will trigger questions 13b - 13w above. If the answer is No, REDCap will move to the next question as follows]



[If the answer is Yes, REDCap will trigger questions 13b - 13w above. If the answer is No, REDCap will move to the next question as follows]



[If the answer is Yes, REDCap will trigger questions 13b - 13w above. If the answer is No, REDCap will move to the next question as follows]



[If the answer is Yes, REDCap will trigger questions 13b - 13w above. If the answer is No, REDCap will move to the next question]



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Section 3B: Production Practices (Others)		
Select the housekeeping methods currently used in your workplace.	 ✓ HEPA-filtered vacuuming □ Dry sweeping □ Compressed air □ Wet sweeping □ No housekeeping procedures ✓ Other Select all that apply. 	
Please indicate any other housekeeping procedures used.		
Which surface preparation tasks do you perform before TSC is applied?	✓ Roughening ✓ Deburring Chamfering Radiusing edges Preheating Masking (high temp tape, paint-on, metal shadow) Abrasive grit blasting Other surface repair Bond coating Wet abrasive blasting Dry abrasive blasting Stripping coating ✓ Other methods Select all that apply.	
Please indicate any other surface preparation tasks you perform.		
Which surface cleaning methods do you apply before or after TSC is applied?	✓ Solvent-based degreasing ✓ Thermal cleaning ✓ Other Select all that apply.	
Please indicate any other surface cleaning method applied.		

For solvent-based degreasing, please select type(s).	Methylethyl ketone Acetone Acetic acid Phosphoric acid Polyphosphates Orthosilicates Other Select all that apply.
Which surface finishing methods do you apply after TSC is applied?	✓ Surface finishing ✓ Heat treating ✓ Sealing ✓ Densification ✓ Gauging and inspection ✓ Other Select all that apply.
For surface finishing method, please select type(s).	✓ Grinding ✓ Vibratory finishing Lapping Brush finishing Diamond belt Turning Select all that apply.
For heat treating method, please select type(s).	✓ Vacuum heat treat ✓ Heat tint ☐ Furnace treat in air ☐ Furnace treat in inert Select all that apply.
For sealing method, please select type(s).	✓ Sealant infiltration✓ Release/non-stick☐ Paint/urethaneSelect all that apply.
For densification method, please select type(s).	Shot peening Heat treatment Select all that apply.

For gauging and inspection method, please select type(s).	✓ Thickness ✓ Roughness □ Fluorescent penetrant □ Temperature □ Hardness □ Microstructure □ Density Select all that apply.
Please describe other surface finishing method.	
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Section 4:	Industry	/ Practices
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or repair parts for or sell to)? Agriculture implements Architectural Automotive engines Business equipment Cement and structural clays Chemical processing Copper and brass mills Computers Defense and aerospace Diesel engines Electrical utilities Pood processing Forging Glass manufacture Hydro-steam turbines Iron and steel tanufacture Hydro-steam turbines Iron and steel asting Iron and steel manufacture Land-based gas turbines Medical Mining, construction, and dredging Nuclear Oil and gas exploration Offshore applications Printing equipment Pulp and paper Petrochemicals Pumps/motors Railroad Rock products Rubber and plastic manufacture Refineries Screening Ship and boat manufacture and repair Steel and rolling mills Textile Texti		
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Automotive engines Business equipment Cement and structural clays Chemical processing Copper and brass mills Computers Defense and aerospace Diesel engines Electrical and electronics Electrical utilities Food processing Forging Glass manufacture Hydro-steam turbines Iron and steel casting Iron and steel casting Iron and steel manufacture Land-based gas turbines Marine manufacture and repair Metal working Medical Mining, construction, and dredging Nuclear Oil and gas exploration Offshore applications Printing equipment Pulp and paper Petrochemicals Pumps/motors Railroad Rock products Rubber and plastic manufacture Refineries Screening Ship and boat manufacture and repair Steel and rolling mills Textile Transportation non-engine Utilities Other	or repair parts for or sell to).	Agriculture implements
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□ Land-based gas turbines □ Marine manufacture and repair □ Medical □ Mining, construction, and dredging □ Nuclear □ Oil and gas exploration □ Offshore applications □ Printing equipment □ Pulp and paper □ Petrochemicals □ Pumps/motors □ Railroad □ Rock products □ Rubber and plastic manufacture □ Refineries □ Screening □ Ship and boat manufacture and repair □ steel and rolling mills ☑ Textile ☑ Transportation non-engine □ Utilities ☑ Other		☐ Iron and steel casting
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Pulp and paper Petrochemicals Pumps/motors Railroad Rock products Rubber and plastic manufacture Refineries Screening Ship and boat manufacture and repair Steel and rolling mills ▼ Textile ▼ Transportation non-engine Utilities ▼ Other		Offshore applications
 □ Petrochemicals □ Pumps/motors □ Railroad □ Rock products □ Rubber and plastic manufacture □ Refineries □ Screening □ Ship and boat manufacture and repair □ Steel and rolling mills ✓ Textile ✓ Transportation non-engine □ Utilities ✓ Other 		Printing equipment
Pumps/motors Railroad Rock products Rubber and plastic manufacture Refineries Screening Ship and boat manufacture and repair Steel and rolling mills ▼ Textile ▼ Transportation non-engine Utilities ▼ Other		Pulp and paper
Railroad Rock products Rubber and plastic manufacture Refineries Screening Ship and boat manufacture and repair Steel and rolling mills ▼ Textile ▼ Transportation non-engine Utilities ▼ Other		Petrochemicals
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Rubber and plastic manufacture Refineries Screening Ship and boat manufacture and repair Steel and rolling mills ▼ Textile ▼ Transportation non-engine Utilities ▼ Other		Railroad
 Refineries Screening Ship and boat manufacture and repair Steel and rolling mills ✓ Textile ✓ Transportation non-engine Utilities ✓ Other 		Rock products
 Screening Ship and boat manufacture and repair Steel and rolling mills ✓ Textile ✓ Transportation non-engine Utilities ✓ Other 		Rubber and plastic manufacture
 Ship and boat manufacture and repair Steel and rolling mills ✓ Textile ✓ Transportation non-engine Utilities ✓ Other 		Refineries
 Steel and rolling mills ✓ Textile ✓ Transportation non-engine Utilities ✓ Other 		Screening
✓ Textile ✓ Transportation non-engine ☐ Utilities ✓ Other		Ship and boat manufacture and repair
✓ Transportation non-engine☐ Utilities✓ Other		Steel and rolling mills
☐ Utilities ☑ Other		✓ Textile
☑ Other		✓ Transportation non-engine
		Utilities
Select all that apply		✓ Other
Science an erior appry.		Select all that apply.

Please indicate other type of industry you do busin with.	ness	
Does your workplace have a written Respiratory Pr Program?	rotection Yes No Don't know	t
Are workers fit-tested for the selected Respiratory Protection Program?	Yes No Don't know	t
Is respirator training provided to production work	ers? Yes No Don't know reset	t
Has air monitoring for particles (metals or dust) an gases ever been performed at your company?	nd/or Yes No Don't know reset	t
<< Previous Page Save	Next Page >> 2 & Return Later	
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Section 5: Future Participation			
Would you be interested in helping NIOSH learn how to better protect worker health and safety by partnering with NIOSH to perform industrial hygiene sampling or medical surveillance of production workers? This would be entirely free to the company. If you choose to participate, NIOSH will protect your identity, your coworker's identity, and the name of your company to the extent allowed by law.	YesNoMaybereset		
,			
We would like to collect workplace contact information. This information is to assist NIOSH in contacting your workplace should you request additional information from NIOSH. Nevertheless, provision of your information listed below is voluntary. NIOSH will not directly identify you or your workplace in any of our study findings.			
First Name			
Last Name			
Work Phone Number			
Work Email Address			
Thank you for your participation and for taking the time to answer these questions. If you have questions about the survey or would like to speak with someone at NIOSH, please contact Emily Lee elee2@cdc.gov or Abbas Virji mvirji@cdc.gov .			
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